

STANDARD INFUSION CONCENTRATIONS: CRITICAL CARE MEDICATIONS

DRUG	DOSAGE RANGE	STANDARD	CONCENTRATED
Amiodarone (Cordarone®/Pacerone®)	0.5-1 mg/min	450 mg/250 mL	
Aminocaproic acid (Amicar®)*	1-1.25 g/hr	10 g/500 mL	
Argatroban	2-10 mcg/kg/min	1 mg/ mL	
Atracurium (Tracrium®)	1-30 mcg/kg/min	100 mg/500 mL	250 mg/250 mL
Cisatracurium (Nimbex®)	0.5-10 mcg/kg/min	100 mg/100 mL	500 mg/100 mL
Dexmedetomidine(Precedex®)	0.2-0.7 mcg/kg/hr Max 1.5 mcg/kg/hr	200 mcg/50 mL NS only (4 mcg/mL)	
Diltiazem (Cardizem®)	5-15 mg/hr	100 mg/100 mL	
Dobutamine (Dobutrex®)	2.5-40 mcg/kg/min	1 g/250 mL	1 g/200 mL
Dopamine (Intropin®)*	mcg/kg/min**	800 mg/500 mL premixed	1600 mg/500 mL
Epinephrine (Adrenalin®)*	1-10 mcg/min	4 mg/500 mL	8 mg/500 mL
Eptifibatide (Integrelin®)	0.5-2 mcg/kg/min	75 mg/100 mL premix	
Esmolol (Brevibloc®)	mcg/kg/min**	2,500 mg/250 mL premixed	Undiluted
Fentanyl (Sublimaze®)	0.5-3 mcg/kg/hr	10-25 mcg/mL	50 mcg/mL
Heparin	800-1600 units/hr	25,000 units/500 mL	
Hydromorphone (Dilaudid®)	0.25-9 mg/hr	0.25-1 mg/mL	10 mg/mL
Insulin, Regular (Novolin®)	1-20 units/hr	100 units/100 mL	
Isoproterenol (Isuprel®)*	0.5-10 mcg/min	2 mg/500 mL	4 mg/500 mL
Labetalol (Normodyne®)*	mg/hr**	200 mg/250 mL	500 mg/250 mL
Lidocaine (Xylocaine®)	1-4 mg/min	2 g/500 mL D5W premixed	4 g/500 mL
Lorazepam (Ativan®)	0.1-2 mg/hr	0.1-0.2 mg/mL	1 mg/mL
Midazolam (Versed®)	0.5-5 mcg/kg/min	100 mg/100 mL	
Milrinone (Primacor®)	0.375-0.75 mcg/ kg/min	20 mg/100 mL	
Nesiritide (Natrecor®)	0.01-0.03 mcg/kg/min	1.5 mg/250 mL	1.5 mg/25 mL
Nicardipine (Cardene®)	2.5-15 mg/hr	40 mg/200 mL	200 mg/100 mL
Nitroglycerine (Tridil®)*	2.5-400 mcg/min	200 mg/500 mL	
Nitroprusside (Nipride®)*	0.25-10 mcg/kg/min	100 mg/500 mL	200 mg/500 mL
Norepinephrine (Levophed®)*	2-60 mcg/min	8 mg/500 mL	16 mg/500 mL in NS 32 mg/500 mL in D5W
Pentobarbital (Nembutal®)*	mg/hr**	4 g/500 mL	
Phenylephrine (Neosynephrine®)*	20-400 mcg/min	20 mg/250 mL	250 mg/250 mL
Procainamide (Pronestyl®)	2-6 mg/min	2 g/500 mL	4 g/500 mL
Propofol (Diprivan®)	5-50 mcg/kg/min	Undiluted	Undiluted
Theophylline	16-32 mg/hr	800 mg/500 mL	
Tirofiban (Aggrastat®)	0.1 mg/kg/min	12.5 mg/250 mL	
Vasopressin (Pitressin®)*	40 units IV push (cardiac arrest) 0.04-0.1 units/min (Vasodilatory septic shock) 0.2 – 1 unit/min (GI bleeding)	undiluted 8 units/100 mL or 200 units/500 mL	
Vecuronium (Norcuron®)*	0.8-1.2 mcg/kg/min	10 mg/100 mL	20 mg/100 mL

*=May be further concentrated, call Pharmacy

**=Variable dosing ranges, see IV book

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IV INFUSION CHARTS

	Page
Alteplase – Tissue plasminogen activator (Activase®)	2
Aminocaproic Acid (Amicar®)	3
Aminophylline/Theophylline	4
Argatroban (Argatroban®)	5
Atracurium (Tracrium®)	6
Bivalrudin (Angiomax®)	7
Bretylium (Bretylol®)	8
Cisatracurium (Nimbex®)	9
Dexmedetomidine (Precedex®)	10
Diltiazem (Cardizem®)	11
Dobutamine (Dobutrex®)	12
Dopamine (Intropin®)	13
Dopamine (Concentrated)	14
Drotrecogin Alpha/Activated Protein C (Xigris®)	15
Epinephrine	16
Eptifibatide (Integrilin®)	17
Esmolol (Brevibloc®)	18
Heparin Sodium	19
Insulin (Regular)	20
Isoproterenol (Isuprel®)	21
Labetalol (Normodyne®, Trandate®)	22
Lepirudin (Refludan®)	23
Lidocaine (Xylocaine®)	24
Methylprednisolone (Solu-Medrol®)	25
Milrinone (Primacor®)	26
Nesiritide (Natrecor®)	27
Nicardipine (Cardene®)	28
Nitroglycerin (Nitro-Bid IV®, Tridil®)	29
Nitroprusside (Nipride®)	30
Norepinephrine (Levophed®)	31
Phenylephrine (Neo-Synephrine®)	32
Procainamide HCl (Pronestyl®)	33
Propofolol (Diprivan®)	34
Tirofiban (Aggrastat®)	35
Vasopressin (Pitressin®)	36

ALTEPLASE - TISSUE PLASMINOGEN ACTIVATOR (Activase®)

For myocardial infarction:

Usual dose: Draw bolus of 15 mg/15 mL in syringe; administer over 1 -2 min, then 1.25 mg/kg (not > 85 mg) as an infusion:

Infusion Rate

0.75 mg/kg (not > 50 mg) over 30 min.

0.5 mg/kg (not > 35 mg) over 1 hour

Do not exceed total dose of 100 mg. See additional information located in the Hospital-Wide (New) Policies on the HH Web Services page for fibrinolytic.

For acute stroke:

Usual dose: 0.9 mg/kg (90 mg max). See information in the Hospital-Wide Policies (NEW) on acute ischemic stroke.

For pulmonary embolism:

Usual dose: 100 mg over 2 hours.

Preparation: Reconstitute alteplase using the solution provided by manufacturer to a final concentration of 100 mg/100 mL of solution.

AMINOCAPROIC ACID (Amicar®)

Standard dilution: 10 g/500 mL NS

Usual dose: 4 – 5 g infused over 1 hour followed by 1 - 1.25 g/hr as a continuous infusion.

Precautions: Administration of more than 30 g in a 24 hour period is not recommended. Rapid IV injection of undiluted drug is not recommended. Monitor for bleeding and **dysrhythmias.**

Preparation: Also stable in D5W

AMINOPHYLLINE/THEOPHYLLINE

Standard dilution: aminophylline 1 g/500 mL NS or theophylline 800 mg/500 mL D5W premixed
The infusion rate may have been rounded to the nearest 1 milliliter.

In terms of AMINOPHYLLINE 1 g/500 mL (2 mg/mL)		In terms of THEOPHYLLINE 800 mg/500 mL (1.6 mg/mL)	
Dose (mg/hr)	Rate (mL/hr)	Dose (mg/hr)	Rate (mL/hr)
k =	(2)	k =	(1.6)
10	5	10	6
15	8	15	9
20	10	20	13
25	13	25	16
30	15	30	19
35	18	35	22
40	20	40	25
45	23	45	28

$$k \text{ Amino} = \frac{1000 \text{ mg}}{500 \text{ mL}}$$

$$k \text{ Theo} = \frac{800 \text{ mg}}{500 \text{ mL}}$$

Usual dose: Adult loading dose (LD) is 5 mg/kg of theo given over 30 - 60 min: (do not exceed 25 mg/min) (note: each mg/kg of theo = a serum level of 2 mcg/mL)

**Check baseline level prior to loading dose.

Adult Dose Range = 0.25 mg/kg/hr (CHF or cirrhosis)
(aminophylline) = 0.5 mg/kg/hr (nonsmoking adult)
= 0.75 mg/kg/hr (smoking adult)

Adult Dose Range = 0.2 mg/kg/hr (CHF or cirrhosis)
(theophylline) = 0.4 mg/kg/hr (non smoking adult)
= 0.7 mg/kg/hr (smoking adult)

Precautions: To avoid dosing errors please write infusion in terms of mL/hr.*

*any order written in D5W will be dispensed as theophylline 800 mg/500 mL premixed IV bag.

*any order written in NS will be dispensed as aminophylline 1 g/500 mL

ARGATROBAN (Argatroban®)

Standard dilution: 250 mg/250 mL NS
(Concentration = 1 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min) Rate (mL/hr)

Argatroban											
Dose/kg	50	60	70	80	90	100	110	120	130	140	150
k	0.333	0.278	0.238	0.208	0.185	0.167	0.152	0.139	0.128	0.119	0.111
0.5	2	2	2	2	3	3	3	4	4	4	5
1	3	4	4	5	5	6	7	7	8	8	9
2	6	7	8	10	11	12	13	14	16	17	18
4	12	14	17	19	22	24	26	29	31	34	36
6	18	22	25	29	32	36	40	43	47	50	54
8	24	29	34	38	43	48	53	58	62	67	72
10	30	36	42	48	54	60	66	72	78	84	90

$$k = \frac{250 \text{ mg}}{250 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: Initial dose is 2 mcg/kg/min, for treatment of heparin-induced thrombocytopenia (HIT) at Hartford Hospital which is lower than the rate recommended per the manufacturer. Titrate infusion to attain aPTT 1.5 – 3 x initial baseline value. Maximum dose is 10 mcg/kg/min for HIT. Rate less than 2 mcg/kg/min is common.

Precautions: Monitor aPTT; bleeding risk. Dose should be reduced in hepatic dysfunction; See information in the Hospital-Wide Policies (NEW) on HIT. Argatroban can elevate the INR providing false INR values. See information in the Hospital-Wide Policies (NEW) on HIT for directions to transition to warfarin therapy.

Preparation: Also stable in D5W, LR.

ATRACURIUM (Tracrium®)

Standard dilution: 100 mg/500 mL NS
(Concentration = 0.2 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min)	Rate (mL/hr)											
Atracurium												
Dose/kg	50	60	70	80	90	100	110	120	130	140	150	
k	0.067	0.056	0.048	0.042	0.037	0.033	0.030	0.028	0.026	0.024	0.022	
1	15	18	21	24	27	30	33	36	39	42	45	
2	30	36	42	48	54	60	66	72	78	84	90	
3	45	54	63	72	81	90	99	108	117	126	135	
4	60	72	84	96	108	120	132	144	156	168	180	
5	75	90	105	120	135	150	165	180	195	210	225	

$$k = \frac{\text{mg}}{\text{mL}} \times \frac{1000 \text{ mg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: 0.4 – 0.5 mg/kg IV bolus; 1 - 30 mcg/kg/min continuous infusion

Precautions: Patient must be on a ventilator

Preparation: Also stable in D5W

BIVALRUDIN (Angiomax®)

Standard dilution: 500 mg/100 mL NS
(Concentration = 5 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mg/kg/hr)	Rate (mL/hr)											
Bivalrudin												
Dose/kg	50	60	70	80	90	100	110	120	130	140	150	
k	0.100	0.083	0.071	0.063	0.056	0.050	0.045	0.042	0.038	0.036	0.033	
0.2	2	2	3	3	4	4	4	5	5	6	6	
0.25	3	3	4	4	5	5	6	6	7	7	8	
1	10	12	14	16	18	20	22	24	26	28	30	
1.75	18	21	25	28	32	35	39	42	46	49	53	

$$k = \frac{\text{mg}}{\text{mL}} \times \frac{1}{\text{kg}}$$

Usual dose: Begin with IV bolus of 0.075 mg/kg then follow with infusion of 175 mg/kg/hr (1 mg/kg/hr for patients with estimated CrCl > 10-29 mL/min) and 0.25 mg/kg/hr for patients on hemodialysis for duration of percutaneous coronary intervention (PCI) procedure. May continue infusion past 4 hours post PCI at original rate and then for 20 hours at reduced infusion rate of 0.2 mg/kg/hr.

Precautions: Bleeding

Preparation: Also stable in D5W, may also prepare 250 mg/50 mL if smaller volume desired.

BRETYLIUM (Bretylol®)

Standard dilution: 2 g/500 mL NS

The infusion rate may have been rounded to the nearest 1 milliliter.

	2 g/500 mL (4 mg/mL)	4 g/500 mL (8 mg/mL)
Dose (mg/min)	Rate (mL/hr)	
k =	(0.067)	(0.133)
1	15	8
2	30	15
3	45	23
4	60	30

$$k = (2 \text{ g}/500 \text{ mL}) = \frac{2 \text{ g}}{500 \text{ mL}} \times \frac{1000 \text{ mg}}{\text{g}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

$$k = (4 \text{ g}/500 \text{ mL}) = \frac{4 \text{ g}}{500 \text{ mL}} \times \frac{1000 \text{ mg}}{\text{g}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: 5-10 mg/kg undiluted bolus (as 5% solution) by IV injection over 1 minute.

then: 1 - 2 mg/min continuous infusion

Wait 10 - 30 min. - then repeat bolus as necessary 10 mg/kg to maximum dose of 35 mg/kg over 24 hours.

Precautions: Side effects include postural hypotension, nausea, and vomiting; monitor BP parameters.

Preparation: Also stable in D5W, D51/2NS, D5NS, LR

CISATRACURIUM (Nimbex®)

Standard dilution: 200 mg/200 mL NS
(Concentration = 1 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min) Rate (mL/hr)

Cisatracurium											
Dose/kg	50	60	70	80	90	100	110	120	130	140	150
k	0.333	0.278	0.238	0.208	0.185	0.167	0.152	0.139	0.128	0.119	0.111
0.5	2	2	2	2	3	3	3	4	4	4	5
1	3	4	4	5	5	6	7	7	8	8	9
2	6	7	8	10	11	12	13	14	16	17	18
5	15	18	21	24	27	30	33	36	39	42	45
10	30	36	42	48	54	60	66	72	78	84	90

$$k = \frac{200 \text{ mg}}{200 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: 0.1 – 0.2 mg/kg bolus, then 0.5 – 10 mcg/kg/min CI

Precautions: Patient must be on a ventilator

Preparation: Also stable in D5W

DEXMEDETOMIDINE (Precedex®)

Standard dilution: 200 mcg/50 mL NS

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/hr) Rate (mL/hr)

Dexmedetomidine											
Dose/kg	50	60	70	80	90	100	110	120	130	140	150
k	0.080	0.067	0.057	0.050	0.044	0.040	0.036	0.033	0.031	0.029	0.027
0.2	3	3	4	4	5	5	6	6	7	7	8
0.3	4	5	5	6	7	8	8	9	10	11	11
0.4	5	6	7	8	9	10	11	12	13	14	15
0.5	6	8	9	10	11	13	14	15	16	18	19
0.6	8	9	11	12	14	15	17	18	20	21	23
0.7	9	11	12	14	16	18	19	21	23	25	26
0.8	10	12	14	16	18	20	22	24	26	28	30
0.9	11	14	16	18	20	23	25	27	29	32	34
1	13	15	18	20	23	25	28	30	33	35	38
1.1	14	17	19	22	25	28	30	33	36	39	41
1.2	15	18	21	24	27	30	33	36	39	42	45
1.3	16	20	23	26	29	33	36	39	42	46	49
1.4	18	21	25	28	32	35	39	42	46	49	53
1.5	19	23	26	30	34	38	41	45	49	53	56

$$k = \frac{200 \text{ mcg}}{50 \text{ mL}} \times \frac{1}{\text{kg}}$$

Usual dose: 1 mcg/kg bolus (use of bolus increases risk of hypotension), then 0.2 –0.1.5 mcg/kg/hr continuous infusion

Precautions: For short-term use (≤ 72 hours); See information in the Hospital-Wide Policies (NEW) on monitoring BP parameters.

Preparation: Do not dilute in D5W

DILTIAZEM (Cardizem®)

Standard dilution: 100 mg/100 mL NS

Dose (mg/hr)	Rate (mL/hr)
k =	(1)
5	5
10	10
15	15

Usual Dose: 15 – 20 mg (0.25 mg/kg) IV loading dose over 2 min, may repeat in 15 min at a dose of 20 - 25 mg (0.35 mg/kg) over 2 min.

then

Maintenance dose: 5 - 15 mg/hr titrated to heart rate

$$k = \frac{100 \text{ mg}}{100 \text{ mL}}$$

Precautions: *Do not use calcium channel blockers for wide-QRS tachycardias of uncertain origin.

*Expect BP drop due to peripheral vasodilation (more BP drop with verapamil than diltiazem). IV calcium can restore BP; consider prophylactic calcium gluconate (1 g) IV before giving calcium channel blockers. Monitor BP and HR parameters.

*Do not use with IV β blockers

Caution with: acute myocardial infarction (MI), atrial fibrillation/flutter with accessory tracts, heart failure, conduction defects

Preparation: Also stable in D5W, or 1/2NS

DOBUTAMINE (Dobutrex®) 1 g/250 mL D5W Premixed (4,000 mcg/mL)
(Concentration = 4 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min)	Rate (mL/hr) (by weight)											
Dobutamine												
Dose/kg	50	60	70	80	90	100	110	120	130	140	150	
k	1.333	1.111	0.952	0.833	0.741	0.667	0.606	0.556	0.513	0.476	0.444	
2.5	2	2	3	3	3	4	4	5	5	5	6	
5	4	5	5	6	7	8	8	9	10	11	11	
7.5	6	7	8	9	10	11	12	14	15	16	17	
10	8	9	11	12	14	15	17	18	20	21	23	
12.5	9	11	13	15	17	19	21	23	24	26	28	
15	11	14	16	18	20	23	25	27	29	32	34	
17.5	13	16	18	21	24	26	29	32	34	37	39	
20	15	18	21	24	27	30	33	36	39	42	45	
25	19	23	26	30	34	38	41	45	49	53	56	
30	23	27	32	36	41	45	50	54	59	63	68	
35	26	32	37	42	47	53	58	63	68	74	79	
40	30	36	42	48	54	60	66	72	78	84	90	

$$k = \frac{1 \text{ g}}{250 \text{ mL}} \times \frac{1000 \text{ mg}}{\text{g}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual Dose: 2.5 – 15 mcg/kg/min, maximum dose 40 mcg/kg/min.

Precautions: Avoid when SBP <90-100 mmHg. May cause tachyarrhythmias, fluctuations in BP, headache, and nausea; monitor BP parameters.

Caution with: recent AMI, arrhythmias and hypovolemia, allergy/hypersensitivity to sulfites.

Preparation: Also stable in NS, 1/2NS, D51/2NS, LR

DOPAMINE (Intropin®)

Standard dilution: 800 mg/500 mL D5W or 400 mg/250 mL D5W (low dose) (1600 mcg/mL)
(Concentration = 1.6 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dopamine	Rate (mL/hr) (by weight)										
Dose/kg	50	60	70	80	90	100	110	120	130	140	150
k	0.533	0.444	0.381	0.333	0.296	0.267	0.242	0.222	0.205	0.190	0.178
1	2	2	3	3	3	4	4	5	5	5	6
2	4	5	5	6	7	8	8	9	10	11	11
3	6	7	8	9	10	11	12	14	15	16	17
4	8	9	11	12	14	15	17	18	20	21	23
5	9	11	13	15	17	19	21	23	24	26	28
8	15	18	21	24	27	30	33	36	39	42	45
10	19	23	26	30	34	38	41	45	49	53	56
15	28	34	39	45	51	56	62	68	73	79	84
20	38	45	53	60	68	75	83	90	98	105	113
25	47	56	66	75	84	94	103	113	122	131	141
30	56	68	79	90	101	113	124	135	146	158	169
40	75	90	105	120	135	150	165	180	195	210	225
50	94	113	131	150	169	188	206	225	244	263	281

$$k = \frac{800 \text{ mg}}{500 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Max Dose: 100 mcg/kg/min
 Low Dose: 1 -5 mcg/kg/min
 Cardiac Dose: 5 - 10 mcg/kg/min
 Vasopressor Dose: 10 -20 mcg/kg/min

Precautions: Use for significant hypotension (systolic BP <70 - 100 mmHg) and signs and symptoms of shock. May use in patients with hypotension but only after volume replacement; use with caution in cardiogenic shock and CHF. May cause tachyarrhythmias, excessive vasoconstriction; monitor BP and HR parameters.

Monitor site for extravasation; may cause skin necrosis.

Preparation: Also stable in NS, LR
 Sodium Bicarbonate will inactivate

DOPAMINE (***)1600 mg/500 mL or 800 mg/250 mL (***) (Concentration = 3.2 mg/mL)
 (***)**CONCENTRATED**(***)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min)	Rate (mL/hr) (by weight)											
Dopamine Conc***												
Dose/kg	50	60	70	80	90	100	110	120	130	140	150	
k	1.067	0.889	0.762	0.667	0.593	0.533	0.485	0.444	0.410	0.381	0.356	
1	1	1	1	2	2	2	2	2	2	3	3	
2	2	2	3	3	3	4	4	5	5	5	6	
3	3	3	4	5	5	6	6	7	7	8	8	
4	4	5	5	6	7	8	8	9	10	11	11	
5	5	6	7	8	8	9	10	11	12	13	14	
8	8	9	11	12	14	15	17	18	20	21	23	
10	9	11	13	15	17	19	21	23	24	26	28	
15	14	17	20	23	25	28	31	34	37	39	42	
20	19	23	26	30	34	38	41	45	49	53	56	
25	23	28	33	38	42	47	52	56	61	66	70	
30	28	34	39	45	51	56	62	68	73	79	84	
40	38	45	53	60	68	75	83	90	98	105	113	
50	47	56	66	75	84	94	103	113	122	131	141	

$$k = \frac{1600 \text{ mg}}{500 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

- Max Dose: 100 mcg/kg/min
- Renal Dose: 1 - 5 mcg/kg/min
- Cardiac Dose: 5 - 10 mcg/kg/min
- Vasopressor Dose: 10 - 20 mcg/kg/min

Precautions: Use for significant hypotension (systolic BP <70 - 100 mmHg) and signs and symptoms of shock. May use in patients with hypotension but only after volume replacement; use with caution in cardiogenic shock and CHF. May cause tachyarrhythmias, excessive vasoconstriction; monitor BP and HR parameters.

Monitor site for extravasation; may cause skin necrosis.

Preparation: Also stable in LR, NS. Sodium Bicarbonate will inactivate.

DROTRECOGIN ALPHA/ACTIVATED PROTEIN C (Xigris®)

Standard dilution: Dose dependent

The infusion rate may have been rounded to the nearest 1 milliliter.

DOSE	VOLUME OF NORMAL SALINE
10 mg	100 mL
15 – 30 mg	150 mL
35 – 50 mg	250 mL

See information in the Hospital-Wide Policies (NEW) on detailed dosing chart.

Usual dose: 24 mcg/kg/hr, continuous infusion

Precautions: Diluted solution stable only 14 hours
Monitor for bleeding.

Preparation: Done by pharmacy staff

EPINEPHRINE

Standard dilution: 4 mg/250 mL D5W
(Concentration = 0.016 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

	4 mg/250 mL (16 mcg/mL)
Dose (mcg/min)	Rate (mL/hr)
k =	(0.267)
1	4
2	8
3	11
4	15
5	19
6	23
7	26
8	30
9	34
10	38

$$k = \frac{4 \text{ mg}}{250 \text{ mL}} = \frac{4 \text{ mg}}{250 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: 0.3 - 1 mg IV push
Continuous Infusion: 1 - 10 mcg/min

Cardiac Arrest Dose:

First dose 1mg IV push, may repeat every 3 - 5 min.
For endotracheal use: 2-2.5 mg diluted in 10 mL NS

Precautions: Monitor BP parameters and electrocardiogram.

Preparation: Use epinephrine 1:1000 ampules (1 mg/mL)
Also stable in NS (not stable in D5NS), Sodium Bicarbonate will inactivate.

EPTIFIBATIDE (Integrilin®)

Standard dilution: 75 mg/100 mL SW premix
(Concentration = 0.75 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min)	Rate (mL/hr) (by weight)											
Eptifibatide												
Dose/kg	50	60	70	80	90	100	110	120	130	140	150	
k	0.250	0.208	0.179	0.156	0.139	0.125	0.114	0.104	0.096	0.089	0.083	
0.5	2	2	3	3	4	4	4	5	5	6	6	
1	4	5	6	6	7	8	9	10	10	11	12	
2	8	10	11	13	14	16	18	19	20	20	20	

Note: Maximum infusion rate is 15 mg/hr or 20 mL/hr

$$k = (75 \text{ mg}/100 \text{ mL}) \times \frac{75 \text{ mg}}{100 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: For acute coronary syndrome (ACS) or percutaneous coronary intervention (PCI) 180 mcg/kg IV bolus (max 22.6 mg) then 2 mcg/kg/min infusion (max 15 mg/hr).

For patients with an estimated creatinine clearance (CrCl) < 50 mL/min, use same bolus dose but decrease infusion rate to 1 mcg/kg/min. For those patients with estimated CrCl <50 mL/min and >121 kg, use maximum IV bolus of 22.6 mg and maximum infusion rate of 7.5 mg/hr.

Precautions: Not compatible with furosemide. Increases risk of bleeding.
Concurrent use with anticoagulants or other anti-platelet agents increases risk of bleeding.
Contraindicated in patients receiving hemodialysis.

Preparation: Use vented infusion set

ESMOLOL (Brevibloc®)

Standard dilution: 5 g/500 mL NS
(10 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min)	Rate (mL/hr) (by weight)											
Esmolol												
Dose/kg	50	60	70	80	90	100	110	120	130	140	150	
k	3.333	2.778	2.381	2.083	1.852	1.667	1.515	1.389	1.282	1.190	1.111	
50	15	18	21	24	27	30	33	36	39	42	45	
100	30	36	42	48	54	60	66	72	78	84	90	
150	45	54	63	72	81	90	99	108	117	126	135	
200	60	72	84	96	108	120	132	144	156	168	180	

$$k = \frac{5 \text{ g}}{500 \text{ mL}} \times \frac{1000 \text{ mg}}{\text{g}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: Loading dose 0.25-0.5 mg/kg given over 1 min.
Loading Dose Rate: (Load in mg) x 6 = Rate in mL/hr x 1 min

Maintenance Dose: Start at 50 mcg/kg/min; if no response in 4 min - rebolus and increase rate by 50 mcg/kg/min. May repeat until therapeutic response is achieved or a 300 mcg/kg/min maintenance infusion is reached.

Usual Dose Range: 50 - 200 mcg/kg/min

Note: Maintenance infusions greater than 200 mcg/kg/min have not been shown to significantly increase therapeutic response; however a few patients may still respond to higher doses.

Precaution: Monitor BP parameters and electrocardiogram
Caution with heart failure, hypotension and bronchospastic/reactive airway disease.

Preparation: Also stable in D5W, 1/2NS, D5NS, LR

HEPARIN SODIUM

Standard dilution: 25,000 units/500 mL D5W
(Concentration = 50 units/mL)

DOSE (units/hr)	RATE (mL/hr)
k=	(50)
800	16
900	18
1000	20
1100	22
1200	24
1300	26
1400	28
1500	30
1600	32
1700	34
1800	36

$$k = \frac{25,000 \text{ units}}{500 \text{ mL}}$$

Dose Range: 800 - 1600 units/hr

LD: 2,000 - 10,000 units over 1-2 minutes depending on indication.

See information in the Hospital-Wide Policies (NEW) on standard or low intensity heparin dosing.

Double concentrated infusions are not permitted due to increased risk of medication errors.

Preparation: Also stable in NS and ½ NS

INSULIN (Regular)

Standard dilution: 100 units/100 mL NS
(Concentration = 1 unit/mL)

Dose (units/hr)	Rate (mL/hr)
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

Usual Dose: 0.05 - 0.1 units/kg/hr

Precaution: Use regular insulin only
Monitor for signs and symptoms of hypoglycemia.
See information in the Hospital-Wide Policies (NEW) on hypoglycemia treatment.

Preparation: Mix in NS. May make larger bags at the same concentration if desired.

ISOPROTERENOL (Isuprel®)

Standard dilution: 2 mg/500 mL NS
(Concentration = 0.004 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

	2 mg/500 mL (4 mcg/mL)	4 mg/500 mL (8 mcg/mL)
Dose (mcg/min)	Rate (mL/hr)	
k =	(0.067)	(0.133)
1	15	8
2	30	15
3	45	23
4	60	30
5	75	38
6	90	45
7	105	53
8	120	60
9	135	68
10	150	75

$$k \text{ (2 mg/500 mL)} = \frac{2 \text{ mg}}{500 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

$$k \text{ (4 mg/500 mL)} = \frac{4 \text{ mg}}{500 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Dose Range: 0.5 - 10 mcg/min; titrate to adequate heart rate

Precautions: Increases myocardial oxygen requirements, which may increase myocardial ischemia. Do not give with epinephrine. Can cause VF/VT; monitor BP parameters and electrocardiogram.

Caution with hypovolemia. Check baseline electrolytes.

Preparation: Also stable in D5W, LR. Protect from light. Sodium Bicarbonate will inactivate

LABETALOL (Normodyne®, Trandate®)

Standard dilution: 200 mg/250 mL NS
(Concentration = 0.8 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

	200 mg/250 mL	500 mg/250 mL
Dose (mg/hr)	Rate (mL/hr)	
k =	(0.8)	(2)
30	38	15
60	75	30
90	113	45
120	150	60

$$k (200 \text{ mg}/250 \text{ mL}) = \frac{200 \text{ mg}}{250 \text{ mL}} = 0.8$$

$$k (500 \text{ mg}/250 \text{ mL}) = \frac{500 \text{ mg}}{250 \text{ mL}} = 2$$

Usual dose: 5 – 100 mg IV over 2 minutes; 30 – 120 mg/hr continuous infusion.

Precautions: Monitor BP parameters; IV push by MD or ICU nurse.

Preparation: Remove 40 mL from NS 250 mL bag; add 200 mg (40 mL) labetalol to make 0.8 mg/mL.
Also stable in D5W.

LEPIRUDIN (Refludan®)

Standard dilution: 100 mg/250 mL NS
(Concentration = 0.4 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mg/kg/hr)	Rate (mL/hr)										
Lepirudin											
Dose/kg	50	60	70	80	90	100	110	120	130	140	150
k	0.008	0.007	0.006	0.005	0.004	0.004	0.004	0.003	0.003	0.003	0.003
0.1	13	15	18	20	23	25	28	30	33	35	38
0.15	19	23	26	30	34	38	41	45	49	53	56
0.2	25	30	35	40	45	50	55	60	65	70	75
0.3	38	45	53	60	68	75	83	90	98	105	113

$$k = \frac{100 \text{ mg}}{250 \text{ mL}} \times \frac{1}{\text{kg}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: IV bolus 0.4 mg/kg (max 44 mg) over 15-20 seconds, then 0.15 mg/kg/hr (initial rate should not exceed 16.5 mg/hr) continuous infusion; reduce dose for renal dysfunction; See information in the Hospital-Wide Policies (NEW) on Heparin-Induced Thrombocytopenia (HIT); adjust rate based on aPTT.

Precautions: Bleeding; See information in the Hospital-Wide Policies (NEW) on HIT for directions to transition to warfarin therapy.

Preparation: Also stable in D5W

LIDOCAINE (Xylocaine®)

Standard dilution: 2 g/500 mL D5W premix
(Concentration = 4 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

	2 g/500 mL	4 g/500 mL
Dose (mg/min)	Rate (mL/hr)	
k =	(0.067)	(0.133)
1	15	8
2	30	15
3	45	23
4	60	30

$$k \text{ (2 g/500 mL)} = \frac{2 \text{ g}}{500 \text{ mL}} \times \frac{1000 \text{ mg}}{\text{g}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

$$k \text{ (4 g/500 mL)} = \frac{4 \text{ g}}{500 \text{ mL}} \times \frac{1000 \text{ mg}}{\text{g}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: Cardiac arrest from VF/VT
1 - 1.5 mg/kg IV bolus at 20 - 50 mg/min may repeat in 3 - 5 min. To maximum of 3 mg/kg. A single dose of 1.5 mg/kg in cardiac arrest is acceptable.

Non arrested patient:

Stable VT, wide complex tachycardia of uncertain type, a significant ectopy: 1 - 1.5 mg/kg IV push. Repeat at 0.5 - 0.75 mg/kg every 5 - 10 min, maximum total dose of 3 mg/kg.

Maintenance infusion of 1 - 4 mg/min.
May be given by ET: 2 - 4 mg/kg diluted in 10 mL NS

Precautions: Prophylactic use in AMI patients not recommended. Reduce maintenance dose (not loading dose) in patients with impaired liver function, left ventricular dysfunction and/or renal insufficiency.

Preparation: Also stable in NS.

METHYLPREDNISOLONE (Solu-Medrol®)
(For Spinal Cord Injury)

Standard dilution: Dose and dilution are weight-based

Usual dose: Bolus: 30 mg/kg (over 15 minutes);
wait 45 minutes then start
maintenance dose infusion

Maintenance Dose: 5.4 mg/kg/hr x 23 hours (when \leq 3 hour post injury)

5.4 mg/kg/hr x 47 hours (when \geq 3 to 8 hour post injury)

Precautions: To be given within 8 hours of injury; use a separate IV line.

Preparation: Stable in D5W. Less stable in NS. NS may be used if necessary. Keep at room temperature.

MILRINONE (Primacor®)

Standard dilution: 20 mg/100 mL D5W Premix
(0.2 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min)		Rate (mL/hr) (by weight)									
Milrinone											
Dose/kg	50	60	70	80	90	100	110	120	130	140	150
k	0.067	0.056	0.048	0.042	0.037	0.033	0.030	0.028	0.026	0.024	0.022
0.375	6	7	8	9	10	11	12	14	15	16	17
0.5	8	9	11	12	14	15	17	18	20	21	23
0.75	11	14	16	18	20	23	25	27	29	32	34

$$k = \frac{20 \text{ mg}}{100 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: Load with 50 mcg/kg administered slowly over 10 minutes continuous infusion 0.375 – 0.75 mcg/kg/min.

Precautions: Do not inject furosemide into the same line, a precipitation will form.

Dose adjustment necessary in renal dysfunction. Risk of arrhythmias. Monitor BP and electrocardiogram.

Preparation: Also stable in NS

NESIRITIDE (Natreacor®)

Standard dilution: 1.5 mg/250 mL NS
(Concentration = 0.006 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min)	Rate (mL/hr) (by weight)											
Nesiritide												
Dose/kg	50	60	70	80	90	100	110	120	130	140	150	
k	0.0020	0.0017	0.0014	0.0013	0.0011	0.0010	0.0009	0.0008	0.0008	0.0007	0.0007	
0.01	5	6	7	8	9	10	11	12	13	14	15	
0.015	8	9	11	12	14	15	17	18	20	21	23	
0.02	10	12	14	16	18	20	22	24	26	28	30	
0.025	13	15	18	20	23	25	28	30	33	35	38	
0.03	15	18	21	24	27	30	33	36	39	42	45	

$$k = \frac{1.5 \text{ mg}}{250 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: IV bolus 2 mcg/kg over 60 seconds; initial infusion 0.01 mcg/kg/min. Increase by 0.005 mcg/kg/min up to a maximum of 0.03 mcg/kg/min.

Precautions: Monitor BP parameters. See information in the Hospital-Wide Policies (NEW).

Risk of hypotension and hypovolemia.

Preparation: Also stable in D5W, D51/2NS, D51/4NS

NICARDIPINE (Cardene®)

Standard dilution: 40 mg/200 mL 0.83% NaCl
(Concentration = 0.2 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

	Dose (mg/hr)	Rate (mL/hr)
	40 mg/200 mL (0.2 mg/mL)	200 mg/100 mL (2 mg/mL)
k =	5	0.5
2.5	13	1
3	15	2
5	25	3
7.5	38	4
10	50	5
12.5	63	6
15	75	8

Usual dose: Initiate therapy at 5 mg/hr. The IV rate may be increased by 2.5 mg/hr every 5 minutes up to a maximum of 15 mg/hr to achieve BP control. For gradual blood pressure reduction, increase rate q15 minutes. Following achievement of BP goal, decrease IV rate to 3 mg/hr. Adjust further to obtain BP goals.

Precautions: Hypotension and tachycardia are common. It may worsen ischemia in patients with coronary disease. Monitor BP parameters. Alternate IV site every 12 hours if given via peripheral vein.

Preparation: Also stable in D5W, D5 ½ NS, D5NS, ½ NS.

NITROGLYCERIN (Nitro-Bid IV®, Tridil®)

Standard dilution: 200 mg/500 mL D5W glass bottle
(Concentration = 0.4 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/min)	Rate (mL/hr)
k =	(6.67)
10	1
20	3
50	7
100	15
200	30
300	45
400	60

$$k = \frac{200 \text{ mg}}{500 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: 2.5 – 400 mcg/min

Precautions: Monitor BP parameters.

Preparation: Use glass container and vented IV set; also stable in NS.

Infuse with specific (nonpolyvinyl chloride) infusion tubing provided by manufacturer through pharmacy.

NITROPRUSSIDE (Nipride®)

Standard dilution: 100 mg/500 mL NS
(Concentration = 0.2 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min)	Rate (mL/hr)											
Nitroprusside												
Dose/kg	50	60	70	80	90	100	110	120	130	140	150	
k	0.067	0.056	0.048	0.042	0.037	0.033	0.030	0.028	0.026	0.024	0.022	
0.25	4	5	5	6	7	8	8	9	10	11	11	
0.5	8	9	11	12	14	15	17	18	20	21	23	
1	15	18	21	24	27	30	33	36	39	42	45	
2	30	36	42	48	54	60	66	72	78	84	90	
3	45	54	63	72	81	90	99	108	117	126	135	
4	60	72	84	96	108	120	132	144	156	168	180	
5	75	90	105	120	135	150	165	180	195	210	225	
6	90	108	126	144	162	180	198	216	234	252	270	
7	105	126	147	168	189	210	231	252	273	294	315	
8	120	144	168	192	216	240	264	288	312	336	360	
9	135	162	189	216	243	270	297	324	351	378	405	
10	150	180	210	240	270	300	330	360	390	420	450	

$$k = \frac{100 \text{ mg}}{500 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: 0.25 - 10 mcg/kg/min titrate up every 3 - 5 min to desired effect. Onset is within 1 – 2 min.

For prolonged therapy at higher doses (> 2 mcg/kg/min), thiosulfate 1 g/100 mg of nitroprusside should be added to prevent cyanide toxicity.

Precautions: Watch for signs of tachyphylaxis, hypotension, CO2 retention, headache, nausea, vomiting, mental status changes, abdominal cramps; monitor BP parameters.

Preparation: Also stable in D5W; solution must be wrapped in foil to protect from light.

NOREPINEPHRINE (Levophed®)

Standard dilution: 8 mg/500 mL D5W

The infusion rate may have been rounded to the nearest 1 milliliter.

8 mg/500 mL 16 mg/500 mL 32 mg/500 mL
(16 mcg/mL) (32 mcg/mL) (64 mcg/mL)

Dose (mcg/min)	Rate (mL/hr)		
	(0.267)	(0.533)	(1.067)
k =	8	4	2
2	11	6	3
3	15	8	4
4	19	9	5
5	30	15	7
8	34	17	8
9	38	19	9
10	41	21	10
11	45	23	11
12	56	28	14
15	64	32	16
17	75	38	19
20	94	50	23
25	113	56	28
30	131	66	33
35	150	75	37
40	169	84	42
45	188	94	47
50	206	103	52
55	225	113	56

$$k = (8 \text{ mg}/500 \text{ mL}) = \frac{8 \text{ mg}}{500 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

$$k = (16 \text{ mg}/500 \text{ mL}) = \frac{16 \text{ mg}}{500 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

$$k = (32 \text{ mg}/500 \text{ mL}) = \frac{32 \text{ mg}}{500 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: Start at 0.5 - 1 mcg/min titrated to effect.

Precautions: Increases myocardial oxygen requirements as it raises BP.
May induce arrhythmias. Use with caution in patients with ischemia. Monitor cardiac output and BP parameters. Extravasation causes tissue necrosis.

Preparation: Norepinephrine must be diluted. To prepare add Norepinephrine to D5W or NS 500 mL IV bag. Preparations in D5W are stable at a higher concentration (32 mg/500 mL) while maximum in NS is 16 mg/500 mL. Do not withdraw. Sodium Bicarbonate will inactivate.

PHENYLEPHRINE (Neo-Syneprine®)

Standard dilution: 20 mg/250 mL NS
(Concentration = 0.08 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

20 mg/250 mL
(80 mcg/mL)

Dose (mcg/min)	Rate (mL/hr)
k =	(1.33)
20	15
30	23
40	30
50	38
75	56
100	75
200	150
300	225
400	300

$$k (40 \text{ mg}/500\text{mL}) = \frac{20 \text{ mg}}{250 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: (Severe Hypotension or Shock): 20 – 400 mcg/min

Precaution: Alpha agonist with little direct effect on heart rate or cardiac output. However, as a powerful vasoconstrictor increases SBP and DBP, therefore may cause reflex bradycardia; monitor BP parameters

Preparation: Also stable in D5W.

PROCAINAMIDE HCL (Pronestyl®)

Standard dilution: 2 g/500 mL NS
(Concentration = 4 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

	2 g/500 mL (4 mg/mL)	4 g/500 mL (8 mg/mL)	4 g/250 mL (16 mg/mL)
Dose (mg/min)	Rate (mL/hr)		
k =	(0.067)	(0.133)	(0.267)
1	15	8	4
2	30	15	8
3	45	23	11
4	60	30	15
5	75	38	19
6	90	45	22

$$k = \frac{2 \text{ g}}{500 \text{ mL}} = \frac{2 \text{ g}}{500 \text{ mL}} \times \frac{1000 \text{ mg}}{\text{g}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

$$k = \frac{4 \text{ g}}{500 \text{ mL}} = \frac{4 \text{ g}}{500 \text{ mL}} \times \frac{1000 \text{ mg}}{\text{g}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

$$k = \frac{4 \text{ g}}{250 \text{ mL}} = \frac{4 \text{ g}}{250 \text{ mL}} \times \frac{1000 \text{ mg}}{\text{g}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: 100 mg every 5 minutes; at 25 - 50 mg/min until rhythm is controlled or a maximum of 1 g is given, or give loading dose of 17 mg/kg infused over 1 hour followed by maintenance infusion of 2 – 6 mg/min.

Precautions: In patients with cardiac or renal dysfunction, reduce loading dose to 12 mg/kg and maintenance infusion to 1 – 2 mg/min. Proarrhythmic, especially in AMI, hypokalemia or hypomagnesemia; monitor BP parameters. Caution in CHF. Monitor procainamide/NAPA levels.

Preparation: Stability in D5W is only 5 hours at room temperature.

PROPOFOL (Diprivan®)

Standard dilution: 1000 mg/100 mL premixed
(Concentration = 10 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min)	Rate (mL/hr)											
Propofol												
Dose/kg	50	60	70	80	90	100	110	120	130	140	150	
k	3.333	2.778	2.381	2.083	1.852	1.667	1.515	1.389	1.282	1.190	1.111	
5	2	2	2	2	3	3	3	4	4	4	5	
10	3	4	4	5	5	6	7	7	8	8	9	
15	5	5	6	7	8	9	10	11	12	13	14	
20	6	7	8	10	11	12	13	14	16	17	18	
25	8	9	11	12	14	15	17	18	20	21	23	
30	9	11	13	14	16	18	20	22	23	25	27	
35	11	13	15	17	19	21	23	25	27	29	32	
40	12	14	17	19	22	24	26	29	31	34	36	
50	15	18	21	24	27	30	33	36	39	42	45	
60	18	22	25	29	32	36	40	43	47	50	54	
75	23	27	32	36	41	45	50	54	59	63	68	
80	24	29	34	38	43	48	53	58	62	67	72	
90	27	32	38	43	49	54	59	65	70	76	81	
100	30	36	42	48	54	60	66	72	78	84	90	

$$k = \frac{1000 \text{ mg}}{100 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual Dose: 5 – 50 mcg/kg/min; maximum dose is **100** mcg/kg/min.

Precautions: Causes respiratory depression, may cause hypotension, pain at peripheral IV site, nausea/vomiting. Caution in patients with hypertriglyceridemia, pancreatitis. Monitor triglycerides. See information in the Hospital-Wide Policies (NEW).

Preparation: Available in premixed bottles.

TIROFIBAN (Aggrastat®)

Standard dilution: 12.5 mg/250 mL Premixed
(Concentration = 0.05 mg/mL)

The infusion rate may have been rounded to the nearest 1 milliliter.

Dose (mcg/kg/min)	Rate (mL/hr)										
Tirofiban											
Dose/kg	50	60	70	80	90	100	110	120	130	140	150
k	0.017	0.014	0.012	0.010	0.009	0.008	0.008	0.007	0.006	0.006	0.006
0.1	6	7	8	10	11	12	13	14	16	17	18
0.2	12	14	17	19	22	24	26	29	31	34	36
0.4	24	29	34	38	43	48	53	58	62	67	72

$$k = \frac{12.5 \text{ mg}}{250 \text{ mL}} \times \frac{1000 \text{ mcg}}{\text{mg}} \times \frac{1}{\text{kg}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: 0.4 mcg/kg/min x 30 min, then 0.1 mcg/kg/min continuous infusion; decrease dose by 50% in patients with CrCl < 30 mL/min.

Precautions: Increases risk of bleeding.

Preparation: Also stable in NS or D5W.

VASOPRESSIN (Pitressin®)

Standard Dilution:

20 units/250 mL NS for vasodilatory septic shock (Concentration = 0.08 units/mL) or 100 units/250 mL NS for GI hemorrhage/variceal bleeding (Concentration = 0.4 units/mL).

The infusion rate may have been rounded to the nearest 1 milliliter.

For vasodilatory septic shock: 40 units/500 mL

Dose (unit/minute)	Rate (mL/hr)
k =	(0.00133)
0.04	30
0.06	45
0.08	60
0.1	75

For GI hemorrhage/variceal bleeding: 200 units/500 mL

Dose (units/minute)	Rate (mL/hr)
k =	(0.0067)
0.2	30
0.4	60
0.6	90
0.8	120
1	150

$$k = \frac{40 \text{ units}}{500 \text{ mL}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

$$k = \frac{200 \text{ units}}{500 \text{ mL}} \times \frac{1 \text{ hr}}{60 \text{ min}}$$

Usual dose: For vasodilatory shock 0.04 – 0.1 unit/minute IV continuous infusion; for GI hemorrhage/variceal bleeding 0.2 – 1 unit/minute IV continuous infusion.

Precautions: May provoke angina in patients with coronary vascular disease and may cause rapid retention of water.

Caution with liver disease, CAD, CHF, and seizures. Monitor BP, electrocardiogram, and electrolytes.

Preparation: Also stable in D5W.