

Prescribed medication	Dosages	Dilution volume (mL)	Concentration ©2023, Y Coleman, Nutrition Consultants Australia	Osmol/kg	Refs
Acetaminophen	1000 mg	50		87	1
Acetaminophen			Solution (32 mg/mL)	5017 ± 0.58	3
Acetazolamide	250 mg	50		5	1
Acetylsalicylic acid	80 mg	50		24	1
Amitriptyline	10 mg 25 mg	50		8 8	1
Amoxicillin		SW	Suspension (50 mg/mL)	1550 ± 15.59	3
Amoxicillin-clavulanate			Suspension (50 mg/mL; 120 mg/mL)	UTBD	3
Atenolol			2 mg/mL	3385	2
Azithromycin			Suspension (40 mg/mL)	UTBD	3
Caffeine			10 mg/mL	82	2
Caffeine citrate			Solution (20 mg/mL)	162 ± 2.66	3
Caffeine citrate			10 mg/mL oral solution	98	4
Calcium gluconate			IV solution (100 mg/mL; 9.3 mg elemental Ca/mL)	302 ± 0	3
Captopril	12.5 mg 25 mg	50		7 9	1
Carbamazepine	100 mg 200 mg 400 mg	50		-1 -2 -3	1
Cephalexin		SW	Suspension (50 mg/mL)	1987 ± 1.53	3
Chlorothiazide			Suspension (50 mg/mL)	UTBD	3
Cholestyramine			Suspension (50 mg/mL)	182 ± 1.73	3
Clindamycin			Solution (15 mg/mL)	1207 ± 1.15	3
Clonidine			Suspension (50 mg/mL)	< 100 ± 0	3
Clopidogrel	75 mg	50		29	1

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C-vitamin			50 mg/mL oral solution	150	4
Dexamethasone			1 mg/mL	353	2
Dexamethasone			Suspension (0.5 mg/mL)	4130 ± 1.73	3
Dextrose oral gel			Gel (400 mg/mL)	10,067 ± 0.58	3
Diazoxide			10 mg/mL	1695	2
Diazoxide			Suspension (50 mg/mL)	UTBD	3
Digoxin			0.05 mg/mL	3670	2
Digoxin			Elixir (50 mcg/mL)	5597 ± 0.58	3
Dipyridamole	200 mg	50		6	1
Domperidone			1 mg/mL	1850	2
Enalapril	2.5 mg 5 mg 10 mg 20 mg	50		16 20 28	1
Enalapril			Suspension (0.5 mg/mL)	4130 ± 1.73	3
Erythromycin ethylsuccinate			Suspension (40 mg/mL)	UTBD	3
Esomeprazole			Suspension (1 mg/mL)	UTBD	3
Famotidine			Suspension (8 mg/mL)	687 ± 0.58	3
Ferrous sulfate			Drops (15 mg/mL)	3117 ± 1.15	3
Fluconazole			10 mg/mL	2020	2
Fluconazole		SW	Suspension (10 mg/mL)	1963 ± 1.15	3
fluconazole			10 mg/mL powder for oral suspension	4,500	4
Furosemide			Solution (8 mg/mL)	7757 ± 2.31	3
Gabapentin	100 mg 300 mg	50		29 75	1

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Gabapentin			Solution (50 mg/mL)	6330 ± 11.27	3
Haloperidol	1 mg	50		45	1
Hydrochloorthiazide	25 mg	50		11	1
Hydrocortisone			1 mg/mL	1850	2
Hydrocortisone			Solution (1 mg/mL)	1107 ± 0.58	3
Ibuprofen			Suspension (20 mg/mL)	3273 ± 4.04	3
Ibuprofen liquid			40 mg/mL	1775	2
Irbesartan	150 mg	50		-2	1
Lamivudine			Solution (10 mg/mL)	1540 ± 1.73	3
Levetiracetam			50 mg/mL	1855	2
Levetiracetam			Solution (100 mg/mL)	3933 ± 1.15	3
Levocarnitine			Solution (100 mg/mL)	905 ± 4.04	3
Linezolid		SW	Solution (20 mg/mL)	1527 ± 2.08	3
Loperamide			Liquid (0.2 mg/mL)	6237 ± 2.89	3
Lorazepam	1 mg	50		9	1
Macrogol	1 sachet	100		364	1
Magnesium sulfate			IV solution (500 mg/mL)	2300 ± 1	3
Metoclopramide			Solution (1 mg/mL)	5027 ± 2.52	3
Metoprolol	12.5 mg 25 mg 50 mg 100 mg	50		-3 13 -1	1
Metronidazole			Suspension (50 mg/mL)	1217 ± 0.58	3
Multivitamin			Solution (not applicable)	10,853 ± 3.51	3
Multivitamin drops			Drops (not applicable)	1450 ± 1	3
Multivitamins	2 tablets	50		50	1

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NaCl			4 mmol/mL concentrate for infusion	9,000	4
Nystatin			Suspension (100,000 units/mL)	3590 ± 0	3
Olanzapine	2.5 mg 5 mg	50		8 9	1
Omeprazole	20 mg	20 ml Antagel® + 20 ml water		730	1
Oseltamivir	75 mg	50		20	1
Oseltamivir		SW	Suspension (6 mg/mL)	1177 ± 0.58	3
Oxazepam	10 mg 50 mg	50		7 12	1
Paracetamol			24 mg/mL oral solution	9,000	4
Pediavit (750 IU vit A, 30 mg vit C, and 400 units vit D per mL)				7450	2
Phenytoin			Suspension (25 mg/mL)	UTBD	3
Phosphate solution Undiluted Diluted 1:1	20 ml	50		944 1885 927	1
Phosphorus		SW	Suspension (25 mg elemental phosphorous/mL)	1870 ± 0	3
Phytonadione			1 mg/mL	25	2
Potassium chloride			IV solution (2 mEq K/mL)	3667 ± 1.15	3
Potassium chloride sol'n Undiluted Diluted 1:1	15 ml	50		749 1833 925	1
Potassium citrate, citric acid		SW	Solution (2 mEq K/mL, 2 mEq bicarbonate/mL)	2200 ± 1	3

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Pravastatin	10 mg 20 mg	50		8 14	1
Prednisolone			Solution (3 mg/mL)	8673 ± 1.15	3
Prednisone	20 mg	50		10	1
Propranolol			Solution (4 mg/mL)	6680 ± 3.61	3
Ranitidine			15 mg/mL	624	2
Rifampin			Suspension (25 mg/mL)	UTBD	3
Sildenafil			2.5 mg/mL	1690	2
Simethicone			Drops (66.7 mg/mL)	473 ± 1.53	3
Simvastatin	40 mg	50		39	1
Sodium bicarbonate			50 mg/mL solution for infusion	1,000	4
Sodium chloride			Solution (4 mEq/mL)	7037 ± 1.15	3
Sodium citrate, citric acid			Solution (1 mEq sodium/mL, 1 mEq bicarbonate/mL)	1870 ± 0	3
Sodium phosphate (4.8 mmol sodium + 4.2 mmol phosphate per mL)				7480	2
Sotalol	80 mg	50		29	1
Spironolactone	25 mg 50 mg 100 mg	50		20 21 21	1
Spironolactone			Drops (66.7 mg/mL)	415 ± 0.58	3
Spironolactone-hydrochlorothiazide			5 mg/mL each	1810	2
Sucrose 24%			Solution (240 mg/mL)	1603 ± 0.58	3

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Temazepam	10 mg 20 mg	50		75 124	1
Theophylline	175 mg	50		39	1
Tramadol	50 mg	50		25	1
Trimethoprim			10 mg/mL	3000	2
Ursodiol			50 mg/mL	1530	2
Ursodiol			Suspension (50 mg/mL)	1030 ± 1	3
Vitamin E (Aquasol E)			50 units/mL	3563	2
Zidovudine			10 mg/mL	3455	2
Zidovudine			Syrup (10 mg/mL)	1030 ± 1	3
UTBD – unable to be determined					

Ref no.	References ©2023, Y Coleman, Nutrition Consultants Australia	Hyperosmolality definition
1	Wesselink, E., Koekkoek, KWAC., Looijen, M., van Blokland, DA., Witkamp, RF. & van Zanten, ARH. 2018. Associations of hyperosmolar medications administered via nasogastric or nasoduodenal tubes and feeding adequacy, food intolerance and gastrointestinal complications amongst critically ill patients: A retrospective study. Clinical Nutrition ESPEN 25:78-86. https://doi.org/10.1016/j.clnesp.2018.04.001	> 500 mOsm/kg
2	Leong, A., Gordon, A., Alshaikh, B., Yusuf, K. & Dersch-Mills, D. 2020. Osmolality of medications administered in the neonatal intensive care unit. Canadian Journal of Hospital Pharmacy 73(4):288-289. PMCID: PMC7556401	> 450 mOsm/kg
3	Shah, DD., Kuzmov, A., Clausen, D., Diu, A. & Robinson, CA. 2021. Osmolality of commonly used oral medications in the neonatal intensive care unit. The Journal of Pediatric Pharmacology & Therapeutics 26(2):172-178. https://doi.org/10.5863/1551-6776-26.2.172	> 500 mOsm/kg
4	Latheef, F., Wahlgren, H., Lilja, HE., Diderholm, B. & Paulsson, M. 2021. The risk of necrotizing enterocolitis following the administration of hyperosmolar enteral medications to extremely preterm infants. Neonatology 118:73-79. https://doi.org/10.1159/000513169	> 450 mOsm/kg

Disclaimer

The information in this article is provided to support Health Professionals. It is not an exhaustive protocol and Health Professionals are advised that adequate professional supervision is accessed to ensure that Duty of Care obligations with respect to safe administration of medicines is met for each consumer.