	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
2	**Amiodarone**	5 mg/mL	20 mg/mL for doses of 75 mg or greater	Fagran has commercially available methylcellulose product that doesn't require pH testing. This drug needs to have a pH very close to 8 to assure particle consistency	Nahata MC, Morosco RS, Hipple TF. Stability of amiodarone in extemporaneous oral suspensions prepared from commercially available vehicles. J Pediatr Pharm Pract. 1999; 4:186-9.	Nahata MC. Stability of amiodarone in an oral suspension stored under refrigeration and at room temperature. Ann Pharmacother. 1997; 31:851-2.
3	**Atenolol**	2 mg/mL			Patel D, Doshi DH, Desai A. Short-term stability of atenolol in oral liquid formulations. Int J Pharm Compound. 1997; 1:437-9.	Garner SS, Wiest DB, Reynolds ER Jr. Stability of atenolol in an extemporaneously compounded oral liquid. Am J Hosp Pharm. 1994; 51:508-11.
4	**Baclofen**	5 mg/mL		There is a kit now avialable using the 5 mg/mL concentration. Concentration of 5 mg/mL can prevent 10 fold dosing errors instead of using a 10 mg/mL concentration.	Johnson CE, Hart SM. Stability of an extemporaneously compounded baclofen oral liquid. Am J Hosp Pharm. 1993; 50:2353-5.	

	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
5	**Bethanacol**	5 mg/mL			Allen LV Jr, Erickson MA III. Stability of bethanechol chloride, pyrazinamide, quinidine sulfate, rifampin, and tetracycline hydrochloride in extemporaneously compounded oral liquids. Am J Health-Syst Pharm. 1998; 55:1804-9.	
6	**Captopril**	1 mg/mL			Nahata MC, Morosco R, Hipple TF. Stability of captopril in liquid containing ascorbic acid or sodium ascorbate. Am J Hosp Pharm. 1994; 51:1707-8.	Nahata MC, Morosco RS, Hipple TF. Stability of captopril in three liquid dosage forms. Am J Hosp Pharm. 1994; 51:95-6.

	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
7	**CloNIDine**	20 mcg/mL[1]		For larger doses, tablets can be easily crushed if needed. Further investigation with the authors of the reference indicated that even though written as a letter to the editor, it was peer reviewed.	Sauberan JB, Phuong P, Ilog, ND. Stability and osmolality of extemporeaneously prepared clonidine oral liquid for neonates. Annals of Pharmacotherapy. 2016;50:243-244[4]	
8	**Chloroquine**	10 mg/mL		Should be labeled as 10 mg/mL of BASE.	Mirochnick M, Barnett E, Clarke DF. Stability of chloroquine in an extemporaneously prepared suspension stored at three temperatures. Pediatr Infect Dis J. 1994; 13:827-8.	

	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
9	**Flecainide**	20 mg/mL		Lots of errors with this in the past: http://www.ismp.org/newsletters/acutecare/showarticle.aspx?id=107	Allen LV Jr, Erickson MA III. Stability of baclofen, captopril, diltiazem hydrochloride, dipyridamole, and flecainide acetate in extemporaneously compounded oral liquids. Am J Health-Syst Pharm. 1996; 53:2179-84.	Loyd AV Jr. Int J Pharmaceut Compd. 1997;(1):103.
10	**Flucytosine**	50 mg/mL		Use more concentrated due to palatability and dosing.	Vandenbussche H, Johnson CE, Yun J, et al. Stability of flucytosine 50 mg/mL in extemporaneous oral liquid formulation. Am J Health-Syst Pharm. 2002; 59:1853-5.	

	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
11	**HydrALAZINE**	4 mg/mL		There is a peer-reviwed study, however the stability for >48 hours is complicated and requires the use of hydralazine powder and multiple ingredients. Strongly consider use of tablets for the outpatient setting unless obtaining from a specialzed compounding pharmacy.[2]	Nahata MC, Pai VB. Pediatric Drug Formulations. 6 th ed. Cincinnati, OH: Harvey Whitney Book; 2011.	Allen LV Jr, Erickson MA III. Stability of alprazolam, chloroquine phosphate, cisapride, enalapril maleate, and hydralazine hydrochloride in extemporaneously compounded oral liquids. Am J Health-Syst Pharm. 1998; 55:1915-20.
12	**HydroCHLOROthiazide**	5 mg/mL		Lends itself to be consistent with aldactazide dosing and concentation.	Allen LV, Erickson MA. Am J Health-Syst Pharm 1996; 53:2304-9.	
13	**Hydrocortisone**	2 mg/mL		Literature strongly supports not using the suspension if treating congenital adrenal hyperplasia.[2]	Chong G, Decarie D, Ensom MHH. Stability of hydrocortisone in extemporaneously compounded suspension. J Inform Pharmacother. 2003; 13:100-10.	

	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
14	**Hydroxyurea**	100 mg/mL		Study used Syrpalta without color.	Heeney MM, Whorton MR, Howard TA, et al. Chemical and functional analysis of hydroxyurea oral solutions. J Pediatr Hematol Oncol. 2004; 26:179-84.	Nahata MC, Pai VB. Pediatric Drug Formulations. 6 th ed. Cincinnati, OH: Harvey Whitney Book; 2011.
15	**Labetalol**	40 mg/mL		The higher concentration was chosen because labetalol is typically not used in neonates and most commonly used for renal patients requiring higher dosing.	Allen LV Jr, Erickson MA III. Stability of labetalol hydrochloride, metoprolol tartrate, verapamil hydrochloride, and spironolactone with hydrochlorothiazide in extemporaneously compounded oral liquids. Am J Health-Syst Pharm. 1996; 53:2304-9.	

	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
16	**Lansoprazole**	3 mg/mL		Should ONLY be compounded if the kit is unavailable and/or reimbursment issues.	DiGiacinto JL, Olsen KM, Bergman KL, et al. Stability of suspension formulations of lansoprazole and omeprazole stored in amber-colored plastic oral syringes. Ann Pharmacother. 2000; 34:600-5.	Morrison JT, Lugo RA, Thigpen JC, et al. Stability of extemporaneously prepared lansoprazole suspension at two temperatures. J Pediatr Pharmacol Ther. 2013; 18:122-7.
17	**MetroNIDAZOLE**	50 mg/mL		Kit is now available in 25 and 50 mg/mL concentrations.	Allen LV, Erickson MA. Am J Health-Syst Pharm. 1996;53:2073-8.	
18	**Metoprolol**	10 mg/mL		Immediate release tablets can also be crushed for larger doses if needed.		
19	**Morphine**	400 mcg/mL[1]		For doses ≤ 200 mcg and the use of a 0.5mL syringe for measurement is recommended. Also be cognizant of how doses are ordered/prescribed (mcg vs. mg) and the dilution being used.	Sauberan JB, Rossi S, Kim, JH. Stability of dilute oral morphine solution for neonatal abstinence syndrome. Journal of Addiction Medicine. 2013;7:113-115.	

	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
20	**NIFEdipine**	4 mg/mL		Most commonly used concentration. The powder is not readily available.	Nahata MC, Pai VB. Pediatric Drug Formulations. 6th ed. Harvey Whitney Books. Cincinnati, OH, 2011.	
21	**Pyrazinamide**	100 mg/mL			Nahata MC, Morosco RS, Peritore SP. Stability of pyrazinamide in two suspensions. Am J Health-Syst Pharm. 1995;52:1558-1560.	
22	**RifAMPin**	25 mg/mL		No reference available for higher concentrations, will add to the want list.	Allen LV Jr, Erickson MA III. Stability of bethanechol chloride, pyrazinamide, quinidine sulfate, rifampin, and tetracycline hydrochloride in extemporaneously compounded oral liquids. Am J Health-Syst Pharm. 1998; 55:1804-9.	

	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
23	**Sodium chloride**	4 mEq/mL		This is also the concentration of the 23.4% injectable. Can also make the 4 mEq/mL with sodium chloride powder and water. Do not try to compound using table salt as concentrations of sodium vary with different salt forms and adverse events have occurred when using this practice.	Using the injectable as straight drug: United States Pharmacopeia, USP 36-NF 31, General Chapter <795>, Pharmaceutical Compounding – Nonsterile Preparations.	Using sodium chloride powder: United States Pharmacopeia, USP 36-NF 31, General Chapter , Pharmaceutical Compounding – Nonsterile Preparations.
24	**Spironolactone**	5 mg/mL		There is a 60 day stability for 25 mg/mL, but need to acknowledge the majority of use is for congenital heart patients that require lower doses. In addition, the concentration is consistent with aldactazide.	Mathur LK, Wickman A. Stability of extemporaneously compounded spironolactone suspensions. Am J Hosp Pharm. 1989; 46:2040-2.	

	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
25	**Tacrolimus**	1 mg/mL		Use the 1 mg/mL so consistent with sirolimus and ease of measurement.	Elefante A, Muindi J, West K, et al. Long-term stability of a patient-convenient 1 mg/mL suspension of tacrolimus for accurate maintenance of stable therapeutic levels. Bone Marrow Transplant. 2006; 37:781-4.	
26	**Thioguanine**	20 mg/mL		There is a reference for 40 mg/mL, however this is an older study that used collagel and the committee agreed that it can't be assumed methylcellulose would have the same stability without futher studies.	Aliabadi HM, Romanick M, Somayaji V, et al. Stability of compounded thioguanine oral suspensions. Am J Health-Syst Pharm. 2011; 68:900-8.	
27	**Topiramate**	20 mg/mL		The 6 mg/mL formulation based upon Nahata poster at ASHP however never published and was never peer-reviwed. **The 20 mg/mL formulation is owned by USP and is copyright protected. Permission is for internal use only and not approved for redistrubution without permission of USP.**[3]		

	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
28	**Ursodiol**	60 mg/mL		Although there is 90 day stability for a 50 mg/mL concentration, this formulation is made from tablets NOT capsules. The committee felt that most hospitals carry the 300 mg capsule and to expect them to order a 250 mg tablet for a longer stability was unreasonable	Johnson CE, Nesbitt J. Stability of ursodiol in an extemporaneously compounded oral liquid. Am J Health-Syst Pharm. 1995; 52:1798-800.	Nahata MC, Pai VB. Pediatric Drug Formulations. 6 th ed. Cincinnati, OH: Harvey Whitney Book; 2011.
29	**ValACYclovir**	50 mg/mL		50 mg/mL only published study - studied in glass. Of note, it helps to rub off the tablet coating with alcohol and compound using a blender.	Fish DN, Vidaurri VA, Deeter RG. Stability of valacyclovir hydrochloride in extemporaneously prepared oral liquids. Am J Health-Syst Pharm. 1999;56:1957-1960.	
30	**Zonisamide**	10 mg/mL			Abobo CV, Wei B, Liang D. Stability of zonisamide in extemporaneously compounded oral suspensions. Am J Health-Syst Pharm. 2009; 66:1105-9.	Nahata MC, Pai VB. Pediatric Drug Formulations. 6th ed. Cincinnati, OH: Harvey Whitney Book; 2011.
31	These concentrations are from the work of ASHP/FDA and are part of the Standardize 4 Safety initiative. The list is copyright protected by ASHP and FDA and should not be used for proprietary reasons or manipulated					
32	1. ISMP has recommended concentrations be displayed as mcg/mL and not mg/mL given the most common doses used. This may need to be addressed for ordering the drug and pharmacy labels dispensed on the					
33	2. These concentrations/preparations have precautions associated with them regarding stability or use.					
34	3. This concentration is copyright protected by USP and can be used for internal purposes only.					

	A	B	C	D	E	F
1	**Drug**	**Standard con-centration**	**Secondary con-centration**	**Comments**	**Reference one**	**Reference Two**
35	4. Although this is a letter to the editor, it was peer-reviewed by 2 external reviewers and followed a normal journal review process so the group chose to use the reference					

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1	**Reference Three**
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1	**Reference Three**
16	Melkoumov A, Soukrati A, Elkin I, et al. Quality evaluation of extemporaneous delayed release liquid formulations of lansoprazole. Am J Health-Syst Pharm. 2011; 68:2069-74.
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