Gateway Pediatric Pharmacy Group

Formulary of Extemporaneous Oral Liquid Medications

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Alternative Formulations for Commercially Available Products / Compounding Kits*

**To be used when the commercially available product is unavailable for use or in other extenuating circumstances*

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Acetazolamide**	**Shelf Life:**	60 days
Concentration:	25 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	500 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Acetazolamide 250 mg tablet		50	Tablets
Ora-Plus/Ora- Sweet	Y	500	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Add a minimal amount of vehicle and mix well to form a viscous, but smooth and uniform paste
3. Continue adding vehicle in geometric portions, mixing well
4. Transfer to graduate
5. Rinse mortar and pestle with vehicle
6. QS to final volume with vehicle. Stir well.

Notes:

- May substitute Ora-Plus/Ora-Sweet mixture with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of acetazolamide, allopurinol, azathioprine, clonazepam, and flucytosine in extemporaneously compounded oral liquids. Am J Health Sys Pharm 1998;53:1944-9.
2. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part I. Secundum Artem. 5(4).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Amphetamine & dextroamphetamine (Adderall)**	**Shelf Life:**	30 days
Concentration:	1 mg/mL	**Storage:**	Room temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Amephetamine & dextroamphetamine (Adderall) 10 mg tablet		12	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Add a minimal amount of vehicle and mix well to form a viscous, but smooth and uniform paste
3. Continue adding vehicle in geometric portions, mixing well
4. Transfer to graduate
5. QS to final volume with vehicle. Shake well.

Notes:

- May Substitute Ora-Plus/Ora-Sweet mixture with Ora-Blend
- Vehicle can also be Ora-Plus or Ora-Sweet used alone

References:

1. Justice J, Kupiec TC, Matthews P. Cardona P. Stability of Adderall in extemporaneously compounded oral liquids. Am J Health Sys Pharm 2001;(58): 1418-21.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Allopurinol**	**Shelf Life:**	60 days
Concentration:	20 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Allopurinol 100 mg tablet		20	Tablets
Ora-Plus/ Ora- Sweet	Y	100	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Add a minimal amount of vehicle and mix well to form a viscous, but smooth and uniform paste
3. Continue adding vehicle in geometric portions, mixing well
4. Transfer to graduate
5. Rinse mortar several times with vehicle; adding rinse to graduate. Stir well.
6. There be a loss in total volume due to the thickness of suspension. Do not QS to final volume.

Notes:

- Final product is a thick, opaque, white suspension.
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of acetazolamide, allopurinol, azathioprine, clonazepam, and flucytosine in extemporaneously compounded oral liquids. Am J Health Sys Pharm 1996;53: 1944-49
2. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part I. Secundum Artem. 5(4).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Amiloride**	**Shelf Life:**	21 days
Concentration:	1 mg/mL	**Storage:**	Refrigerate
Volume:	50 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Amiloride HCl 5 mg tablet		10	Tablets
Glycerin		20	mL
Sterile Water	Y	50	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Add glycerin and mix to a uniform paste
3. Add a small amount of water and mix well
4. Pour mixture into a graduate
5. QS to final volume with sterile water. Stir well.

Notes:

- Final product is a cloudy suspension.

References:

1. Nahata MC, Pai VB, and Hipple TF. Pediatric Drug Formulations. 5th ed. Cincinnati, OH. Harvey Whitney Books Co, 2004.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Amiodarone**	**Shelf Life:**	90 days
Concentration:	5 mg/mL	**Storage:**	Refrigerate
Volume:	200 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Amiodarone 200 mg tablet		5	Tablets
Sodium bicarbonate 8.4% injection		12	mL
Ora-Plus/Ora-Sweet	Y	200	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Mix Ora-Blend with sodium bicarbonate 8.4% to buffer to pH=7
3. Wet powder with a minimal amount of buffered suspension and levigate to form a viscous, but smooth and uniform paste
4. Continue adding vehicle in geometric portions, mixing well
5. Transfer to graduate
6. QS to final volume with buffered vehicle. Stir well.

Notes:

- Suspension will clump if buffer is not added
- Sodium bicarbonate 8.4% is available commercially as an injection or can be compounded by placing 1 teaspoonful of baking soda in 240 mL of warm water and allowing to dissolve
- May substitute Ora-Plus/Ora-Sweet mixture with Ora-Blend

References:

1. Nahata MC, Morosco RS, Hipple TF. Stability of Amiodarone in extemporaneous oral suspensions prepared from commercially available vehicles. J Pediatr Pharmacy Practice 1999;4:186-89.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Amlodipine**	**Shelf Life:**	56 days
Concentration:	1 mg/mL	**Storage:**	Room Temperature
Volume:	250 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Amlodipine 5 mg tablet		50	Tablets
Ora-Plus/Ora-Sweet	Y	250	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Add a minimal amount of vehicle and mix well to form a viscous, but smooth and uniform paste
3. Continue adding vehicle in geometric portions, mixing well
4. Transfer to graduate
5. Rinse mortar with vehicle, adding rinse to graduate
6. QS to final volume with vehicle. Stir well.

Notes:

- May substitute Ora-Sweet/Ora-Plus mixture with Ora-Blend

References:

1. Nahata MC, MOrosco RS, Hipple TF. Stability of amlodipine besylate in two liquid dosage forms. J Am Pharm Assoc 1999;39: 375-7.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Ammonium chloride**	**Shelf Life:**	14 days
Concentration:	267.5 mg/mL	**Storage:**	Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	DO NOT Refrigerate

Ingredients	QS	Quantity	Units
Ammonium Chloride Granules		26.75	Grams
Sterile Water	Y	100	mL

Directions:

1. Weigh Ammonium Chloride granules on balance
2. Transfer granules to plastic amber bottle
3. Measure water slightly less than desired final volume in a graduated cylinder
4. Add the water to the bottle and shake vigorously till all granules have dissolved
5. Transfer liquid back to graduated cylinder and QS to final volume

Notes:

- Refrigeration causes precipitation

References:

1. U.S.P. on Compounding: A Guide for the Compounding Practitioner. Copyright 2013, The United States Pharmacopeial Convention (online version access at http://compounding.usp.org), <795> Pharmaceutical Compounding- Nonsterile Preparations, water-containing formulations

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Aprepitant**	**Shelf Life:**	90 days
Concentration:	20 mg/mL	**Storage:**	Refrigerate
Volume:	50 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Aprepitant 125 mg capsule		8	Capsules
Ora-Plus/Ora-Sweet	Y	50	mL

Directions:

1. Empty contents of capsules in a mortar and pestle and triturate to a fine powder
2. Add a minimal amount of vehicle and mix well to form a viscous, but smooth and uniform paste
3. Continue adding vehicle in geometric portions, mixing well
4. Transfer to graduate
5. Rinse mortar with vehicle, adding rinse to graduate
6. QS to final volume with vehicle. Stir well.

Notes:

- May substitute Ora-Plus/Ora-Sweet mixture with Ora-Blend

References:

1. Dupis LL, Ligertat-Walsh K, Walker SE. Stability of an extemporaneous oral liquid aprepitant formulation. Support Care Cancer 2009;6(17): 701-6.

Gateway Pediatric Pharmacy Group Standardized Oral Liquid Formulations

Drug name:	**Atenolol**	**Shelf Life:**	90 days
Concentration:	2 mg/mL	**Storage:**	Refrigerate
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Atenolol 50 mg tablet		4	Tablets
Glycerin		Small	Amount
Ora-Sweet SF	Y	100	mL

Directions:

1. Crush tablets in mortar and triturate to a fine powder
2. Levigate with a small amounts of glycerin to form a paste
3. Add Ora-Sweet SF in geometric portions. Mix thoroughly.
4. Transfer to an amber bottle. Rinse mortar with Ora-Sweet SF
5. QS to 100 mL with remaining Ora-Sweet SF

Notes:

References:

1. Patel D, Doshi DH, Desai A. Short-term stability of atenolol in oral liquid formulations. Int J Pharm Compd 1997;1(6):437-9.
2. Nahata MC, Pai VB. Pediatric Drug Formulations. 4th ed. Cincinnati, OH: Harvey Whitney Book; 2000.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Azathioprine**	**Shelf Life:**	60 days
Concentration:	50 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Cytotoxic Material Handle Properly

Ingredients	QS	Quantity	Units
Azathioprine 50 mg tablet		120	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Add minimal amount of vehicle to form thick, viscous but smooth and uniform mixture
3. Add vehicle in geometric portions, mixing well
4. Transfer to graduate
5. Rinse mortar and pestle, adding to graduate
6. QS to final volume with vehicle. Stir well.

Notes:

- Contact precautions required. Must be prepared in a biological safety cabinet or vertical air flow hood with proper personal protective equipment.
- May substitute Ora-Plus/Ora-Sweet mixture with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of acetazolamide, allopurinol, azathioprine, clonazepam, and flucytosine in extemporaneously compounded oral liquids. Am J Health Syst Pharm 1996;53:1944-49.
2. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part I. Secundum Artem. 5(4).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Baclofen**	**Shelf Life:**	60 days
Concentration:	10 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Baclofen 10 mg tablet		120	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Gradually add vehicle and mix until uniform paste
3. Transfer to appropriately sized amber bottle
4. QS to final volume with vehicle. Stir well.

Notes:

- Final product is a thick, opaque, off-white suspension
- May substitute Ora-Plus/Ora-Sweet mixture with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of baclofen, captopril, diltiazem hydrochloride, dipyridamole, and flecainide acetate in extemporaneously compounded oral liquids. Am J Health Syst Pharm 1996;53(18):2179-84.
2. Johnson CE, Hart SM. Stability of an extemporaneously compounded baclofen oral liquid. Am J Hosp Pharm 1993;50(11):2353-5.
3. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part II. Secundum Artem. 6(1).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Bethanechol**	**Shelf Life:**	30 days
Concentration:	1 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Bethanechol 10 mg tablet		12	Tablets
Sterile Water	Y	120	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Add small portions of sterile water and mix to a uniform paste
3. Mix while adding sterile water in incremental proportions to almost 120 mL
4. Transfer to graduate
5. Rinse mortar with sterile water, adding rinse to graduate
6. QS to final volume with sterile water

Notes:

References:

1. Schlatter JL and Saulnier JL. Bethanechol chloride oral solutions: stability and use in infants. Ann Pharmacother 1997;31(3):294-6.

Gateway Pediatric Pharmacy Group Oral Liquid Compounds

Drug name:	**Bosentan**	**Shelf Life:**	30 days
Concentration:	6.25 mg/mL	**Storage:**	Room Temperature or Refrigerate
Volume:	30 mL	**Auxiliary Labeling:**	Shake well; Protect from light; Cytotoxic Material Handle Properly

Ingredients	QS	Quantity	Units
Bosentan 62.5 mg tablet		3	Tablets
Glycerin		small	amount
Flavor Plus	Y	15	mL
Flavor Sweet	Y	15	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Add small amount of glycerin
3. Add 10 mL of 1:1 FlavorPlus:FlavorSweet and vigorously triturate
4. Add another 10 mL of FlavorPlus:FlavorSweet mixture with trituration
5. Transfer to amber prescription bottle
6. Rinse mortar with 10 mL FlavorPlus:FlavorSweet mixture, adding rinse to bottle

Notes:

- Contact precautions required. Must be prepared in a biological safety cabinet or vertical air flow hood with proper personal protective equipment. Equipment can include double gloving, wearing a protective gown, and using a respiratory mask if preparation does not occur in a fume hood.
- FlavorPlus and FlavorSweet are manufactured by Humco and are the same as Ora-Plus and Ora-Sweet, manufactured by Perrigo

References:

1. Malik A, Gorman G, Coward L, Arnold JJ. Stability of an extemporaneously compounded oral suspension of bosentan. Hosp Pharm 2016;51:389-395.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Busulfan**	**Shelf Life:**	30 days
Concentration:	2 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Cytotoxic Material Handle Properly

Ingredients	QS	Quantity	Units
Busulfan 2 mg tablet		120	Tablets
Simple Syrup	Y	120	mL

Directions:

1. Don proper attire for preparing chemotherapy
2. Grind tablets to a fine powder in mortar
3. Add a small portions of simple syrup and mix to a uniform paste
4. Mix while adding the simple syrup in incremental portions to almost 120 mL
5. Transfer to graduate
6. Rinse mortar with simple syrup, adding rinse to graduate
7. QS to final volume with vehicle
8. Transfer to an amber bottle

Notes:

- Chemotherapy – use appropriate precautions when handling and disposing
- Stable 2 days at room temperature

References:

1. Allen LV. Busulfan oral suspension. US Pharm 1990;15(11):94-5.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Captopril**	**Shelf Life:**	56 days
Concentration:	1 mg/mL	**Storage:**	Refrigerate
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Captopril 50 mg tablet		2	Tablets
Ascorbic acid 500 mg tablet		1	Tablet
Distilled water	Y	100	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Add a minimal amount of water and mix well
3. Continue adding water in geometric portions, mixing well
4. Transfer to graduate
5. Rinse mortar and pestle with vehicle
6. Add ascorbic acid tablet to mixture and allow to dissolve
7. QS to final volume with vehicle. Stir well.

Notes:

- Stable 14 days at room temperature
- May replace ascorbic acid 500 mg tablet with sodium ascorbate 500 mg injection

References:

1. Nahata MC, Morosco RS, Hipple TF. Stability of captopril in three liquid dosage forms. Am J Health Sys Pharm 1994;51:1707-08.
2. Nahata MC, Pai VB and Hipple TF, Pediatric Drug Formulations, 6th Ed. Cincinnati, OH: Harvey Whitney Books Co. 2011.

Gateway Pediatric Pharmacy Group Oral Liquid Compounds

Drug name:	**Carbidopa/Levodopa**	**Shelf Life:**	42 days
Concentration:	1.25/5 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Carbidopa/Levodopa 25/100 mg tablet		6	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Grind tablets into a fine powder in mortar
2. Levigate powder with small amount of Ora-Blend
3. Add Ora-Blend in increasing amounts while mixing thoroughly
4. Transfer contents into an amber bottle. Rinse mortar with Ora-Blend
5. QS to desired final volume with remaining Ora-Blend

Notes:

- Stable 28 days at room temperature
- Do NOT use controlled release tablets
- May substitute Ora-Plus/Ora-Sweet mixture with Ora-Blend

References:

1. Nahata MC, Morosco RS, and Leguire LE. Development of two stable oral suspensions of levodopa-carbidopa for children with amblyopia. J Pediatr Ophthalmol Strabismus 2000;37(6):333-7.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Carvedilol**	**Shelf Life:**	84 days
Concentration:	1.25 mg/mL	**Storage:**	Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Carvedilol 25 mg tablet		5	Tablets
Distilled Water		15	mL
Ora-Plus/Ora-Sweet	Y	100	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Add distilled water and mix well to form a uniform paste
3. Continue adding vehicle in geometric portions, mixing well
4. Transfer to calibrated amber bottle
5. Rinse mortar and pestle with vehicle and pour into amber bottle
6. QS to final volume with vehicle. Stir well.

Notes:

- May substitute Ora-Sweet/Ora-Plus mixture with Ora-Blend

References:

1. Loyd A. Carvedilol 1.25 mg/ml oral suspension. Int J Pharm Compd 2006;10(3):220.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Chloroquine**	**Shelf Life:**	60 days
Concentration:	15 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Chloroquine Phosphate 250 mg tablet		6	Tablets
Ora-Plus/Ora-Sweet	Y	100	mL

Directions:

1. Crush tablets with mortar and pestle to a fine powder
2. Levigate powder with small amounts of vehicle until a smooth paste is formed. Add more vehicle to the paste until a liquid is formed. Transfer the contents to a graduate.
3. Use additional vehicle to rinse the mortar and pestle and add to graduate
4. QS to final volume with vehicle. Stir well.
5. Transfer to amber bottle

Notes:

- May substitute Ora-Plus/Ora-Sweet with Cherry syrup
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of alprazolam, chloroquine phosphate, cisapride, enalapril maleate, and hydralazine hydrochloride in extemporaneously compounded oral liquids. Am J Health Syst Pharm 1998;55(18):1915-20.
2. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part III. Secundum Artem. 6(2).

Gateway Pediatric Pharmacy Group Standardized Oral Liquid Formulations

Drug name:	**Chlorpromazine**	**Shelf Life:**	90 days
Concentration:	100 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Chlorpromazine HCl powder		10	Grams
Ora-Sweet	Y	100	mL

Directions:

1. Accurately weigh chlorpromazine powder using appropriate methods
2. Add vehicle in geometric proportions to powder. Mix thoroughly.
3. Transfer ingredients to amber prescription bottle
4. QS with Ora-Sweet to final desired volume

Notes:

References:

1. Prohotsky DL, Juba KM, Zhao F. Formulation and stability of an extemporaneously compounded oral solution of chlorpromazine HCl. J Pain Palliat Care Pharmacother 2014;28(4):367-70.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Clonazepam**	**Shelf Life:**	60 days
Concentration:	0.1 mg/mL	**Storage:**	Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Clonazepam tablet		10	mg
Ora-Plus/Ora-Sweet	Y	100	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to form a fine powder, or use bulk powder
2. Slowly add vehicle and mix well to form a uniform paste and then a uniform suspension
3. Transfer to graduate
4. Rinse mortar and pestle with vehicle and pour into graduate
5. QS to final volume with vehicle

Notes:

- May use cherry syrup 100mL in place of Ora-Sweet/Ora-Plus mixture
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of acetazolamide, allopurinol, azathioprine, clonazepam, and flucytosine in extemporaneously compounded oral liquids. Am J Health Syst Pharm 1996; 53(16):1944-9.
2. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part I. Secundum Artem. 5(4).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Clonidine**	**Shelf Life:**	35 days
Concentration:	20 mcg/mL	**Storage:**	Refrigerate
Volume:	30 ml	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Clonidine 0.1 mg tablet		6	Tablets
Simple Syrup NF	Y	30	mL

Directions:

1. Triturate tablets in a glass mortar and pestle to a fine powder
2. Levigate with a small amount of Simple Syrup NF
3. Transfer to graduate amber bottle
4. Rinse mortar and pestle with Simple Syrup NF and pour into bottle
5. QS to final volume with Simple Syrup NF

Notes:

References:

1. Sauberan JB, Phuong P, Ilog ND, Rossi SS. Stability and osmolality of extemporaneously prepared clonidine oral liquid for neonates. Ann Pharmacother 2016;50(3):243-244.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Clopidogrel**	**Shelf Life:**	60 days
Concentration:	5 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Clopidogrel 75 mg tablet		8	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Crush tablets in a mortar and pestle and triturate to a fine powder
2. Add a minimal amount of vehicle and mix well to form a viscous, but smooth and uniform paste
3. Continue adding vehicle in geometric portions, mixing well
4. Transfer to graduate
5. Rinse mortar and pestle with vehicle
6. QS to final volume with vehicle. Stir well.

Notes:

- May substitute Ora-Plus/Ora-Sweet mixture with Ora-Blend

References:

1. Skillman KL, Caruthers RL, Johnson CE. Stability of an extemporaneously prepared clopidogrel oral suspension. Am J Health Sys Pharm 2010;67:599-601.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Cyclophosphamide**	**Shelf Life:**	56 days
Concentration:	10 mg/mL	**Storage:**	Refrigerate
Volume:	200 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate, Cytotoxic Material Handle Properly, Not for Injection

Ingredients	QS	Quantity	Units
Cyclophosphamide 2 gram injection		2	Grams
Normal Saline injection		100	mL
Simple Syrup NF	Y	200	mL

Directions:

1. Don proper attire for preparing chemotherapy
2. Reconstitute cyclophosphamide with normal saline for a resulting solution of 20 mg/mL
3. Add simple syrup in geometric portions with constant stirring
4. Transfer to bottle

Notes:

- Chemotherapy – use appropriate precautions when handling and disposing
- Requires injectable cyclophosphamide and 0.9% sodium chloride
- May substitute Simple Syrup with Ora-Plus
- Stable 8 days at room temperature in Simple Syrup and 3 days in Ora-Plus

References:

1. Kennedy R, Groepper D, Tagen M et al. Stability of cyclophosphamide in extemporaneous oral suspensions. Ann Pharmacother 2010;44:295-301.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Dantrolene**	**Shelf Life:**	2 days
Concentration:	5 mg/mL	**Storage:**	Refrigerate
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Dantrolene 50 mg capsule		10	Capsules
Citric Acid		150	mg
Distilled Water		10	mL
Simple Syrup	Y	100	mL

Directions:

1. Place dantrolene capsule contents in a mortar
2. Dissolve citric acid in distilled water
3. Add citric acid and water solution to capsule contents and levigate into a smooth paste
4. Add simple syrup in geometric proportions, mix well, and transfer to graduated cylinder
5. Rinse mortar with additional simple syrup and transfer to graduated cylinder.
6. QS to 100 mL with simple syrup
7. Transfer to plastic amber bottle

Notes:

References:

1. Nahata MC, Pai VB, and Hipple TF, Pediatric Drug Formulations, 5th ed, Cincinnati, OH: Harvey Whitney Books Co, 2004.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Dapsone**	**Shelf Life:**	90 days
Concentration:	2 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	200 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Dapsone 25 mg tablet		16	Tablets
Ora-Plus/Ora-Sweet	Y	200	mL

Directions:

1. Crush tablets in mortar and reduce to fine powder
2. Add a small amount of vehicle and mix to a uniform paste
3. Add geometric proportions of vehicle and transfer to graduated cylinder
4. Rinse mortar and pestle with vehicle and transfer to graduated cylinder
5. QS to volume with base solution
6. Transfer to plastic amber bottle

Notes:

- May substitute Ora-Sweet/Ora-Plus with Ora-Blend

References:

1. Nahata MC, Morosco RS, Trowbridge JM. Stability of dapsone in two oral liquid dosage forms. Am Pharmacother 2000;34:848-50.
2. Nahata MC, Pai VB. Pediatric Drug Formulations. 6th ed. Cincinnati, OH: Harvey Whitney Book; 2011.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Diltiazem**	**Shelf Life:**	60 days
Concentration:	12 mg/mL	**Storage:**	Room Temperature or Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Protect from Light

Ingredients	QS	Quantity	Units
Diltiazem HCl 90 mg tablet		16	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Place diltiazem tablets in a mortar and comminute to a fine powder
2. Mix 60 mL of Ora-Sweet with 60 mL of Ora-Plus to use as vehicle. Shake well before use.
3. Add approximately 10 mL of vehicle to powder and mix to form uniform paste
4. Add vehicle in geometric portions almost to volume, mixing thoroughly after each addition
5. Transfer contents of mortar to graduated cylinder
6. Rinse mortar and pestle with vehicle solution and transfer to graduated cylinder
7. QS with vehicle to bring final volume to 120 mL
8. Transfer to plastic amber bottle

Notes:

- May substitute Ora-Plus/Ora-Sweet with Cherry Syrup
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of baclofen, captopril, diltiazem hydrochloride, dipyridamole, and flecainide acetate in extemporaneously compounded oral liquids. Am J Health-Sys Pharm 1996;53:2719-84.
2. Jew RK, Soo-Hoo W, Erush SC. Extemporaneous Formulations for Pediatric Geriatric, and Special Needs Patients.2nd ed. Bethesda, MD: American Society of Health System Pharmacists; 2010.
3. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part II. Secundum Artem. 6(1).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Dipyridamole**	**Shelf Life:**	60 days
Concentration:	10 mg/mL	**Storage:**	Room Temperature or Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Protect from Light

Ingredients	QS	Quantity	Units
Dipyridamole 50 mg tablet		24	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Place dipyridamole tablets in a mortar and comminute to fine powder
2. Add 60 mL of Ora-Sweet to 60 mL of Ora-Plus to use as vehicle. Shake well before use.
3. Add approximately 20 mL of vehicle to powder and mix to uniform paste
4. Add vehicle in geometric portions almost to desired volume, mixing thoroughly after each addition
5. Transfer contents of mortar to graduated cylinder
6. Rinse mortar and pestle with vehicle solution and pour into graduated cylinder
7. QS with vehicle for a total volume of 120 mL
8. Transfer to plastic amber bottle
9. Shake well

Notes:

- May substitute Ora-Plus/Ora-Sweet with Cherry syrup.
- May Substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of baclofen, captopril, diltiazem hydrocholoride, dipyridamole, and flecainide acetate in extemporaneously compounded oral liquids. Am J Health-Sys Pharm 1996;53:2719-84.
2. Jew RK, Soo-Hoo W, Erush Sc. Extemporaneous Formulation for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. Bethesda, MD. American Society of Health System Pharmacists; 2010.
3. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part II. Secundum Artem. 6(1).

1.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Ethambutol**	**Shelf Life:**	30 days
Concentration:	50 mg/mL	**Storage:**	Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Ethambutol 400 mg tablet		15	Tablets
Cherry Syrup	Y	120	mL

Directions:

1. Remove coating from ethambutol tablets with alcohol swabs
2. Triturate tablets into a fine powder in a mortar
3. Use a small amount of cherry syrup to wet the powder and levigate to a smooth paste
4. Add cherry syrup via geometic dilution almost to volume, mixing thoroughly after each addition
5. Transfer contents into a graduated cylinder
6. Rinse mortar and pestle with cherry syrup and add to graduate cylinder
7. QS with cherry syrup to final volume
8. Mix well

Notes:

References:

1. Nahata MC, Pai VB. Pediatric Drug Formulations. 6th ed. Cincinnati, OH: Harvey Whitney Book; 2011.

Gateway Pediatric Pharmacy Group Oral Liquid Compounds

Drug name:	**Etoposide**	**Shelf Life:**	22 days
Concentration:	10 mg/mL	**Storage:**	Room temperature
Volume:	50 mL	**Auxiliary Labeling:**	Shake Well, Cytotoxic Material Handle Properly, Not for Injection

Ingredients	QS	Quantity	Units
Etoposide 20 mg/mL injection		25	mL
Normal Saline		25	mL

Directions:

1. Don proper attire for preparing chemotherapy
2. Add etoposide and normal saline into an amber bottle
3. Shake well

Notes:

- Chemotherapy – use appropriate precautions when handling and disposing
- Prior to oral administration, further mix with fruit juice (orange, apple, or lemon; **NOT** grapefruit juice) to a concentration of <0.4 mg/mL; once mixed with fruit juice, use within 3 hours

References:

1. McLeod HL, Relling MV. Stability of etoposide solution for oral use. Am J Hosp Pharm 1992;49(11):2784-5.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Flecainide Acetate**	**Shelf Life:**	60 days
Concentration:	20 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Protect from Light

Ingredients	QS	Quantity	Units
Flecainide acetate 100 mg tablet		24	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Triturate flecainide acetate tablets to a fine powder in a mortar
2. Levigate with approximately 20 mL of vehicle to form a paste
3. Add additional vehicle via geometric portions almost to volume, mixing thoroughly after each addition
4. Rinse the mortar and pestle with base and pour into graduate cylinder
5. Transfer to glass amber bottle
6. Shake well

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May substitute Ora-Plus/Ora-Sweet with Cherry syrup
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of baclofen, captopril, diltiazem, hydrochloride, dipyridamole, and flecainide acetate in extemporaneously compounded oral liquids. Am J Health Syst Pharm 1996; 53:2179-84.
2. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part II. Secundum Artem. 6(1).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Flucytosine**	**Shelf Life:**	90 days
Concentration:	50 mg/mL	**Storage:**	Room Temperature
Volume:	60 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Flucytosine 250 mg capsule		12	Capsules
Ora-Plus/Ora-Sweet	Y	60	mL

Directions:

1. Empty flucytosine capsules into a mortar and reduce to a fine powder
2. Add approximately 15 mL of vehicle and mix to form a uniform paste
3. Add vehicle in geometric proportions to almost desired volume while mixing
4. Transfer to an amber bottle. Rinse mortar with vehicle
5. QS to final desired volume with remaining vehicle

Notes:

- May replace Ora-Plus/Ora-Sweet with Ora-Blend

References:

1. VandenBussche HL, Johnson Ce, Yun J, et al. Stability of flucytosine 50 mg/ml in extemporaneous oral liquid formulations. Am J Health Syst Pharm 2002;59:1853-5.
2. Jew RK, Soo-Hoo W, Erush SC. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. Bethesda MD. American Society of Health System Pharmacists. 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Folic Acid**	**Shelf Life:**	60 days
Concentration:	1 mg/mL	**Storage:**	Refrigerate
Volume:	10 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients		QS	Quantity	Units
Folic acid 1 mg tablet			10	Tablets
Simple Syrup		Y	10	mL

Directions:

1. Crush tablets in a mortar
2. Add a small amount of simple syrup to form a paste
3. Transfer to an amber bottle. Rinse mortar with distilled water
4. QS to desired final volume with remaining distilled water

Notes:

- May flavor with raspberry essence, according to reference

References:

1. Gunasekaran GH, Jusoh ND, Saridin N. The stability of folic acid suspension. Int J Sci Res Publ 2015;5:8.

2.

Gateway Pediatric Pharmacy Group Oral Liquid Compounds

Drug name:	**Granisetron**	**Shelf Life:**	90 days
Concentration:	50 mcg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	20 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Granisetron 1 mg tablet		1	Tablet
Ora-Blend SF	Y	20	mL

Directions:

1. Crush tablet in a mortar
2. Add Ora-Blend SF in geometric proportions while mixing
3. Transfer to an amber bottle. Rinse mortar with Ora-Blend SF
4. QS to final desired volume with remaining Ora-Blend SF

Notes:

References:

1. Nahata MC, Morosco RS, Hipple TF. Stability of granisetron hydrochloride in two oral suspensions. Am J Health Syst Pharm 1998;55(23):2511-3.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Hydralazine**	**Shelf Life:**	30 days
Concentration:	4 mg/mL	**Storage:**	Refrigerate
Volume:	30 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate, Not for Injection

Ingredients	QS	Quantity	Units
Hydralazine 20 mg/ml injection		6	mL
Propylene Glycol		2.4	mL
Distilled Water	Y	30	mL

Directions:

1. Add desired amounts of hydralazine and propylene glycol to amber bottle
2. QS with distilled water to final volume

Notes:

References:

1. Nahata MC, Pai VB. Pediatric Drug Formulations. 3rd ed. Harvey Whitney Books. Cincinnati, OH, 1998.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Hydrochlorothiazide**	**Shelf Life:**	60 days
Concentration:	5 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	50 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Hydrochlorothiazide 25 mg tablet		10	Tablets
Ora-Plus/Ora-Sweet	Y	50	mL

Directions:

1. Grind hydrochlorothiazide tablets into a fine powder
2. Add a small amount of vehicle to form a uniform paste
3. Add 30 mL of 1:1 Ora-Sweet/Ora-Plus in small portions to achieve a uniform mixture
4. Transfer to a graduate and rinse mortar and pestle with small amounts of vehicle
5. QS to final volume with vehicle

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part II. Secundum Artem. 6(1).
2. Allen LV, Erickson MA. Stability of labetalol hydrochloride, metoprolol tartrate, verapamil hydrochloride and spironolactone with hydrochlorothiazide in extemporaneously compounded oral liquids. Am J Health Syst Pharm 1996;53(19):2304-9.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Hydrocortisone**	**Shelf Life:**	91 days
Concentration:	2 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Hydrocortisone 10 mg tablet		24	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Triturate tablets to a fine powder in a mortar and pestle
2. Mix 60 mL Ora-Sweet with 60 mL of Ora-Plus to use as base solution. Shake well before use.
3. Levigate powder with a small amount of base solution to form a paste
4. Add base solution via geometric dilution almost to volume, mixing thoroughly with each addition
5. Transfer contents into graduated cylinder
6. Rinse mortar and pestle with base and transfer to graduated cylinder
7. QS to 120 mL with base solution
8. Transfer to plastic amber bottle
9. Shake well

Notes:

- Use of oral suspension is not recommended due to uneven distribution of drug in liquid
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend

References:

1. Jew RK, Soo-Hoo W, Erush SC. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. Bethesda, MD: American Society of Health System Pharmacists;2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Hydroxychloroquine**	**Shelf Life:**	30 days
Concentration:	25 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Hydroxychloroquine sulfate 200 mg tablet		15	Tablets
Ora-Plus		60	mL
Sterile Water for irrigation	Y	120	mL

Directions:

1. Remove coating of hydroxychloroquine tablets with towel moistened with alcohol
2. Crush hydroxychloroquine tablets to a fine powder using a mortar and pestle.
3. Add 15 mL of Ora-Plus to the powder and levigate to form a fine paste
4. Add the remaining Ora-Plus via geometric dilution, mixing thoroughly after each addition
5. Transfer the mixture to a graduated cylinder
6. Rinse the mortar and pestle using a small amount of water for irrigation and transfer to graduated cylinder
7. QS to 120 mL using sterile water

Notes:

References:

1. Nahata MC, Pai VB. Pediatric Drug Formulations. 6th ed. Cincinnati, OH; Harvey Whitney Book; 2011.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Hydroxyurea**	**Shelf Life:**	90 days
Concentration:	100 mg/mL	**Storage:**	Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well, Cytotoxic Material Handle Properly

Ingredients	QS	Quantity	Units
Hydroxyurea 500 mg capsule		20	Capsules
Distilled Water		50	mL
Cherry Syrup	Y	100	mL

Directions:

1. Don proper attire for preparing chemotherapy
2. Empty capsules into an amber bottle and add distilled water
3. Allow capsules contents to dissolve for 20 minutes. Shake/stir vigorously. May take several hours.
4. Place filter paper inside funnel and filter into another amber bottle
5. Once filtered, QS to final desired volume with cherry syrup

Notes:

- Chemotherapy – use appropriate precautions when handling and disposing
- Stable for 180 days at room temperature
- May also use equal amount of hydroxurea powder in place of capsules

References:

1. Heaney MM, Whorton MR, Howard TA, et al. Chemical and functional analysis of hydroxyurea oral solutions. J Pediatr Hematol Oncol 2004;26(3):179-84.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Isradipine**	**Shelf Life:**	35 days
Concentration:	1 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate, Protect from Light

Ingredients	QS	Quantity	Units
Isradipine 5 mg capsule		24	Capsules
Glycerin		Small	Amount
Simple Syrup	Y	120	mL

Directions:

1. Empty capsules into glass mortar and grind into a fine powder
2. Wet the powder with the smallest amount of glycerin possible forming a smooth uniform paste
3. Add a small amount of syrup and mix well
4. Continue adding syrup geometrically until almost final volume, mixing well
5. Rinse mortar with syrup and add rinse to graduate
6. Add QS of syrup to 120 mL and dispense in an glass amber bottle

Notes:

- Must mix and dispense in glass

References:

1. MacDonald JL, Johnson CE, Jacobson P. Stability of isradipine in an extemporaneously compounded oral liquid. Am J Hosp Pharm 1994;51:2409-11.
2. Jew RK, Soo-Hoo W, Erush Sc. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. Bethesda MD; American Society of Health System Pharmacists;2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Ketoconazole**	**Shelf Life:**	60 days
Concentration:	20 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Ketoconazole 200 mg tablet		12	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Crush tablets in a mortar and grind into a fine powder
2. Wet the powder with the smallest amount of vehicle possible forming a smooth uniform paste
3. Continue adding vehicle geometrically until almost final volume, mixing well
4. Rinse mortar with syrup and add rinse to graduate
5. Add QS of syrup to final volume

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF
- May also substitute cherry syrup/simple syrup in 1:4 mixture

References:

1. Allen LV, Erickson MA. Stability of ketoconazole, metolazone, metronidazole, procainamide hydrochloride, and spironolactone in extemporaneously compounded oral liquids. Am J Health Syst Pharm 1996;53:2073-8.
2. Jew RK, Soo-Hoo W, Erush SC. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. Bethesda, MD: American Society of Health System Pharmacists;2010.
3. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part I. Secundum Artem. 5(4).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Labetalol**	**Shelf Life:**	60 days
Concentration:	40 mg/mL	**Storage:**	Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Protect from Light

Ingredients	QS	Quantity	Units
Labetalol 200 mg tablet		24	tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Crush tablets into a fine powder
2. Add 20 mL of Ora-Plus/Ora-Sweet 1:1 mixture and mix to form a uniformed paste
3. Mix while adding Ora-Plus/Ora-Sweet 1:1 mixture in geometric proportions and QS to 120 mL

Notes:

- Can use Labetalol 300 mg tablets #16
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of labetalol hydrochloride, metoprolol tartrate, verapamil hydrochloride, and spironolactone with hydrochlorthiazide in extemporaneously compounded oral liquids. Am J Health Syst Pharm 1996;53(19):2304-9.
2. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part II. Secundum Artem. 6(1).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Lamotrigine**	**Shelf Life:**	91 days
Concentration:	1 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well, Protect from Light

Ingredients	QS	Quantity	Units
Lamotrigine 100 mg tablet		1	Tablet
Glycerin		Small	Amount
Ora-Plus/Ora-Sweet	Y	100	mL

Directions:

1. Crush tablet in a mortar and pestle and reduce to a fine powder
2. Levigate with a small amount of glycerin to form a paste
3. Add small portions of the chosen vehicle while mixing thoroughly
4. Transfer to a graduated cylinder
5. Rinse mortar with vehicle and add quantity of vehicle sufficient to make 100 ml
6. Transfer to amber bottle

Notes:

- May substitute Ora-Sweet/Ora-Plus mixture with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Nahata MC, Morosco RS, Hipple TF. Stability of lamotrigine in two extemporaneously prepared oral suspensions at 4° and 25° C. Am J Health Syst Pharm 1999;56:240-242.
2. Jew RK, Soo-Hoo W, Erush. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. American Society of Health System Pharmacists. Bethesda MD, 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Leucovorin**	**Shelf Life:**	14 days
Concentration:	10 mg/mL	**Storage:**	Refrigerate
Volume:	10 mL	**Auxiliary Labeling:**	Refrigerate, Protect from Light

Ingredients	QS	Quantity	Units
Leucovorin Calcium 100 mg injection		1	Vial
Sterile Water for injection		10	mL

Directions:

1. Reconstitute the leucovorin calcium under sterile conditions with 10 mL of sterile water
2. Draw up individual doses in syringes and seal with oral tip caps

Notes:

References:

1. U.S.P. on Compounding: A Guide for the Compounding Practitioner. Copyright 2013, The United States Pharmacopeial Convention (online version access at http://compounding.usp.org), <795> Pharmaceutical Compounding- Nonsterile Preparations, water-containing formulations

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Levothyroxine**	**Shelf Life:**	14 days
Concentration:	25 mcg/mL	**Storage:**	Refrigerate
Volume:	80 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Levothyroxine 200 mcg tablet		10	Tablets
Ora-Plus/Ora-Sweet	Y	80	mL

Directions:

1. Crush tablets in a mortar and grind into a fine powder
2. Mix Ora-Plus and Ora-Sweet thoroughly in geometric proportions to prepare the vehicle
3. Add small amount of the vehicle with the tablets to create a smooth suspension
4. Add vehicle in geometric proportions with constant mixing
5. Transfer to graduate
6. Rinse mortar and pestle with vehicle
7. Add vehicle to QS to final volume
8. Dispense in amber bottle

Notes:

- May substitute Ora-Sweet/Ora-Plus with Ora-Blend

References:

1. Nahata MC. Stability of levothyroxine, doxycycline, hydrocortisone, and pravastatin in liquid dosage forms stored at two temperatures. Int J Pharm Compd 2015;19(5):428-31.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Lisinopril**	**Shelf Life:**	90 days
Concentration:	1 mg/mL	**Storage:**	Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Lisinopril 20 mg tablet		5	Tablets
Ora-Plus/Ora-Sweet	Y	100	mL

Directions:

1. Place five Lisinopril 20 mg tablets into a clean mortar
2. Triturate tablets into a fine powder
3. Add small quantity of Ora-Plus and mix to form a smooth paste
4. Add the remainder of the 50 mL Ora-Plus in geometric proportions and mix well
5. QS to 100 mL with Ora-Sweet and mix well.

Notes:

- May substitute Ora-Sweet/Ora-Plus with Ora-Blend

References:

1. Allen LV. Contemporary compounding: Lisinopril 1mg/ml oral liquid. US Pharmacist 2013;38(2):36-37.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Losartan**	**Shelf Life:**	28 days
Concentration:	2.5 mg/mL	**Storage:**	Refrigerate
Volume:	200 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Losartan 50 mg tablet		10	Tablets
Distilled Water		10	mL
Ora-Plus/Ora-Sweet	Y	200	mL

Directions:

1. Place tablets into amber plastic prescription bottle
2. Add distilled water
3. Cap and shake mixture for two minutes
4. Let stand for one hour, then shake for one more minute
5. Add QS vehicle to final volume and shake for one minute

Notes:

- Grinding tablets is not necessary
- May substitute Ora-Plus/Ora-Sweet mixture with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Cozaar Package Insert. Merck and Co. Inc, Whitehouse Station, NJ; 2014.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Mesna**	**Shelf Life:**	7 days
Concentration:	50 mg/mL	**Storage:**	Room temperature
Volume:	20 mL	**Auxiliary Labeling:**	Not for Injection: 12 hour stability once drawn up in oral syringe

Ingredients	QS	Quantity	Units
Mesna 100 mg/mL injectable		10	mL
Cherry Syrup		10	mL

Directions:

1. Add mesna plus cherry syrup to amber bottle

Notes:

- Only stable for 12 hours in oral syringe

References:

1. Goren MP, Lyman BA, Li JT. The stability of mesna in beverages and syrup for oral administration. Cancer Chemother Pharmacol 1991:28(4):298-301.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Methimazole**	**Shelf Life:**	30 days
Concentration:	3 mg/mL	**Storage:**	Refrigerate
Volume:	40 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Methimazole 5 mg tablet		24	Tablets
Distilled Water	Y	20	mL
Simple Syrup	Y	20	mL

Directions:

1. Combine simple syrup and sterile water. Stir well.
2. Using mortar and pestle, pulverize methimazole tablets into a fine powder
3. Add a small amount of syrup/water mixture and mix into a uniform paste
4. Continue to gradually add vehicle, stirring after each addition
5. Transfer to an amber bottle. Rinse mortar with syrup/water mixture
6. QS to final volume with remainder of syrup/water mixture

Notes:

References:

1. Rappaport PL. Extemporaneous dosage preparations for pediatrics. Canadian J Hosp Pharm 1983;36(3):66-71.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Metolazone**	**Shelf Life:**	60 days
Concentration:	1 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Metolazone 10 mg tablet		12	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Crush tablets in a mortar and grind into a fine powder
2. Wet the powder with the smallest amount of vehicle possible forming a smooth, uniform paste
3. Continue adding vehicle geometrically until almost final volume, mixing well
4. Rinse mortar with syrup and add rinse to graduate
5. Add QS of syrup to final volume

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May substitute Ora-Plus/Ora-Sweet with cherry syrup diluted 1:4 with simple syrup
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of ketoconazole, metolazone, metronidazole, procainamide hydrochloride, and spironolactone in extemporaneously compounded oral liquids. Am J Health Syst Pharm 1996;53:2073-8.
2. Jew RK, Soo-hoo W, Erush S. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. American Society of Health System Pharmacists. Bethesda, MD. 2010.
3. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part I. Secundum Artem. 5(4).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Metoprolol**	**Shelf Life:**	60 days
Concentration:	10 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Metoprolol tartrate 100 mg tablet		12	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Crush tablets in a mortar and grind into a fine powder
2. Wet the powder with the smallest amount of vehicle possible forming a smooth uniform paste
3. Continue adding vehicle geometrically until almost final volume
4. Rinse mortar with syrup and add rinse to graduate
5. Add QS of syrup to final volume

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May substitute Ora-Plus/Ora-Sweet with cherry syrup
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Jew RK, Soo-Hoo W, Erush. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. American Society of Health System Pharmacists. Bethesda, MD. 2010.
2. Allen LV, Erickson MA. Stability of labetalol hydrochloride, metoprolol tartrate, verapamil hydrochloride and spironolactone with hydrochlorothiazide in extemporaneously compounded oral liquids. Am J Health Syst Pharm 1996;53(19):2304-9.
3. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part II. Secundum Artem. 6(1).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Metronidazole**	**Shelf Life:**	60 days
Concentration:	50 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Protect From Light

Ingredients	QS	Quantity	Units
Metronidazole powder		6	Grams
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Crush metronidazole tablets into a fine powder
2. Add a small amount of 1:1 mixture of Ora-Plus/Ora-Sweet and mix into a uniform paste
3. Mix while adding the vehicle in geometric portion to almost 120 mL
4. Transfer to calibrated bottle and QS to 120 mL with vehicle

Notes:

- May substitute metronidazole powder for equal amount of metronidazole tablets
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. Stability of ketoconazole, metolazone, metronidazole, procainamide hydrochloride, and spironolactone in Extemporaneously Compounded Oral Liquids. Am J Health Syst Pharm 1996;53:2073-2078
2. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part I. Secundum Artem. 5(4).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Mexiletine**	**Shelf Life:**	91 days
Concentration:	10 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Mexiletine 150 mg capsule		8	Capsules
Distilled Water	Y	120	mL

Directions:

1. Empty capsules into mortar and grind into a fine powder
2. Wet the powder with the smallest amount of distilled water possible forming a smooth uniform paste
3. Continue adding distilled water geometrically until almost final volume, mixing well
4. Rinse mortar with distilled water and add rinse to graduate
5. Add QS of distilled water to final volume

Notes:

- Room temperature stability is 70 days
- May substitute base solution with sorbitol. Refrigerated expiration: 28 days. Room temperature expiration: 14 days.

References:

1. Nahata MC, Morosco RS, Hipple TF. Stability of mexiletine in two extemporaneous formulations stored under refrigeration and at room temperature. J Am Pharm Assoc 2000;40:257-259.
2. Jew RK Soo-Hoo W, Erush SC. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. American Society of Health System Pharmacists. Bethesda, MD, 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Morphine***	**Shelf Life:**	60 days
Concentration:	0.4 mg/mL	**Storage:**	Room Temperature
Volume:	30 mL	**Auxiliary Labeling:**	Shake Well, Protect from Light

Ingredients	QS	Quantity	Units
Morphine 2 mg/mL oral liquid		6	mL
Sterile Water	Y	30	mL

Directions:

1. Add 24 mL of Sterile Water to 6 mL of Morphine 2 mg/mL oral liquid

Notes:

* Different concentration than the commercially available product
- *To be used only in neonates and infants or when the commercially available product is unavailable for use*

References:

1. Sauberan J, Rossi S, Kim JH. Stability of dilute oral morphine solution for neonatal abstinence syndrome. J Addict Med 2013;7(2):113-5.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Nadolol**	**Shelf Life:**	30 days
Concentration:	10 mg/mL	**Storage:**	Refrigerate
Volume:	80 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Nadolol 80 mg tablet		10	Tablets
Ora-Plus/Ora-Sweet	Y	80	mL

Directions:

1. Crush tablets in a mortar and grind into a fine powder
2. Wet the powder with a small amount of vehicle forming a smooth uniform paste
3. Continue adding vehicle geometrically, mixing well into a uniform mixture
4. Transfer to graduate, rinse mortar with small amounts of vehicle
5. Add QS of vehicle to final volume 80 mL
6. Dispense in amber bottle

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend

References:

1. Nahata MC, Pai VB. Pediatric Drug Formulations. 6th ed. Harvey Whitney Books. Cincinnati, OH, 2011.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Nifedipine**	**Shelf Life:**	90 days
Concentration:	4 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Nifedipine 10 mg capsule		40	Capsule
Ora-Plus/Ora-Sweet	Y	100	mL

Directions:

1. Withdraw nifedipine liquid from capsules using needle and syringe
2. Measure the required amount of nifedipine liquid and add to mortar
3. Add vehicle in geometric proportions and mix well
4. Transfer to graduated cylinder, rinse mortar with vehicle
5. Add QS of vehicle to final volume

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- For most effective withdrawal, puncture opposite side of capsule prior to extraction to create a vent.
- Concentration inside capsule may vary depending on manufacturer

References:

1. Nahata MC, Pai VB. Pediatric Drug Formulations. 6th ed. Harvey Whitney Books. Cincinnati, OH. 2011.
2. Nahata MC, Morosco RS, Willhite EA. Stability of nifedipine in two oral suspensions stored at two temperatures. J Am Pharm Assoc 2002;42(6):865-7.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Oxandrolone**	**Shelf Life:**	90 days
Concentration:	1 mg/mL	**Storage:**	Room Temperature
Volume:	60 mL	**Auxiliary Labeling:**	Shake Well, Protect from Light

Ingredients	QS	Quantity	Units
Oxandrolone 2.5 mg tablet		24	Tablets
Ora-Plus/Ora-Sweet	Y	60	mL

Directions:

1. Crush the oxandrolone tablets in a mortar and pestle to a fine powder
2. Add a small amount of vehicle and mix to a uniform paste
3. In small portions, add and mix in more vehicle
4. Transfer this mixture to a 60 mL prescription bottle
5. Rinse mortar with small portions of vehicle and pour into prescription bottle
6. Add sufficient quantity of vehicle to bring the final product volume to 60 mL

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Johnson CE, Cober MP, Hawkins KA, et al. Stability of extemporaneously prepared oxandrolone oral suspensions. Am J Health Syst Pharm 2011;68(6): 519-21

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Pantoprazole**	**Shelf Life:**	62 days
Concentration:	2 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Pantoprazole 40 mg tablet		6	Tablets
Sodium Bicarbonate powder		10.1	Grams
Sterile Water for injection	Y	120	mL

Directions:

1. Remove imprint from tablets by gently rubbing on a paper towel dampened with ethanol
2. Allow tablets to air dry for a few minutes
3. Triturate tablets to a fine powder in a mortar and pestle
4. Transfer the contents of the mortar to an appropriate size beaker
5. Add 100 ml of sterile water and place the beaker on a magnetic stirrer
6. Add 5 grams of sodium bicarbonate powder and continue to stir for approximately 20 minutes until all tablet remnants have disintegrated and the coating is dissolved
7. Add remaining sodium bicarbonate powder and stir for approximately 5 minutes until the powder dissolves
8. Add enough sterile water to achieve the final volume indicated
9. Transfer the solution into an appropriate size plastic amber bottle. Shake well to mix.

Notes:

References:

1. Dentinger PJ, Swenson CF, Anaizi NH. Stability of pantoprazole in an extemporaneously compounded oral liquid. Am J Health Syst Pharm 2002;59:953-956.
2. Jew RK, Soo-Hoo W, Erush. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. American Society of Health System Pharmacists. Bethesda, MD. 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Pentoxifylline**	**Shelf Life:**	91 days
Concentration:	20 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Pentoxifylline 400 mg tablet		6	Tablets
Sterile Water for irrigation	Y	120	mL

Directions:

1. Triturate tabs into fine powder in mortar
2. Add water to make smooth paste
3. Add water in with mixture and mix thoroughly
4. Transfer contents of mortar to graduated cylinder
5. Rinse mortar/pestle with base solution, transfer to graduate and QS to final volume
6. Pour final product into appropriately sized amber bottle

Notes:

References:

1. Nahata MC, Pai VB, Hipple TF. Pediatric Drug Formulations, 6th edition. Cincinnati OH; Harvey Whitney Books Co, 2004.

2.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Procainamide**	**Shelf Life:**	60 days
Concentration:	50 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Procainamide HCl 250 mg capsule		24	Capsule
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Open capsules and place the powder into a mortar
2. Reduce to a fine powder
3. Add 20 mL of vehicle and levigate to a uniform paste
4. Add vehicle in geometric proportions almost to volume, mixing thoroughly after each addition, and transfer to a graduated cylinder
5. Rinse the mortar and pestle with vehicle, add to the graduated cylinder and QS to 120 mL using vehicle

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend.
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part I. Secundum Artem. 5(4).
2. Nahata MC, Pai VB. Pediatric Drug Formulations. 6th ed. Harvey Whitney Books. Cincinnati, OH. 2011.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Propylthiouracil**	**Shelf Life:**	91 days
Concentration:	5 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Propylthiouracil 50 mg tablet		12	Tablet
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Triturate propylthiouracil tablets to a fine powder in a mortar and pestle
2. Levigate with a small amount of base solution to form a paste
3. Add base solution in increasing amounts while mixing thoroughly
4. Transfer contents of the mortar to a graduated cylinder
5. Rinse the mortar and pestle with base solution and pour into graduated cylinder
6. Add base solution to the graduated cylinder to achieve the total volume
7. Transfer contents of the graduated cylinder into an appropriate size plastic amber bottle.
8. Shake well to mix

Notes:

- Proper precautions must be taken when preparing solution. Follow institution policy for handling procedures.
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May use 60 mL methylcellulose 1% mixed with 60 mL simple syrup NF as base
- May be stored at room temperature for 70 days

References:

1. Nahata MC, Morosco RS, Trowbridge JM. Stability of propylthiouracil in extemporaneously prepared oral suspensions at 4 and 25°C. Am J Health Syst Pharm 2000;57:1141-43.
2. Jew RK, Soo-Hoo W, Erush. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients.2nd ed. American Society Health System Pharmacists. Bethesda, MD. 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Pyrazinamide**	**Shelf Life:**	60 days
Concentration:	100 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Pyrazinamide 500 mg tablet		24	Tablets
Simple Syrup	Y	120	mL

Directions:

1. Triturate tablets to a fine powder in a mortar and pestle
2. Levigate with a small amount of base solution to form a paste
3. Add base solution in increasing amounts while mixing thoroughly
4. Transfer contents of the mortar to a graduated cylinder.
5. Rinse the mortar and pestle with base solution and pour into graduated cylinder
6. Add base solution to the graduated cylinder to achieve the total volume indicated above
7. Transfer contents of the graduated cylinder into an appropriate size glass or amber bottle
8. Shake well to mix

Notes:

- May substitute base solution with 60 mL Methylcellulose 1% mixed with 60 mL simple syrup NF
- May be stored at room temperature for 45 days

References:

1. Nahahta MC, Morosco RS, Peritore SP. Stability of pyrazinamide in two suspensions. Am J Health Syst Pharm 1995;52:1558-60.
2. Jew RK, Soo-Hoo W, Erush. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. American Society of Health System Pharmacists. Bethesda, MD. 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Pyridoxine**	**Shelf Life:**	91 days
Concentration:	25 mg/mL	**Storage:**	Refrigerate
Volume:	60 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate, Not for Injection

Ingredients	QS	Quantity	Units
Pyridoxine 100 mg/ml injection		15	mL
Ora-Plus/Ora-Sweet	Y	60	mL

Directions:

1. Using a syringe and needle, withdraw 15 mL of pyridoxine solution from vials.
2. Transfer to a calibrated bottle
3. QS with 1:1 mixture of Ora-Plus/Ora-Sweet

Notes:

- Stable at room temperature for 91 days in plastic bottle or oral syringe
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Ensom MHH, Décarie D. Stability of extemporaneously compounded pyridoxine in glass and plastic bottles and plastic syringes. Can J Hosp Pharm 2014;67(5):394-396.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Pyrimethamine**	**Shelf Life:**	91 days
Concentration:	2 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	125 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Pyrimethamine 25 mg tablet		10	Tablets
Simple Syrup/Methylcellulose 1%	Y	125	mL

Directions:

1. Triturate tablets to a fine powder in a mortar and pestle
2. Levigate with a small amount of base solution to form a paste
3. Add base solution in increasing amounts while mixing thoroughly
4. Transfer contents of the mortar to a graduated cylinder
5. Rinse the mortar and pestle with base solution and pour into graduated cylinder
6. Add base solution to the graduated cylinder to achieve the total volume
7. Transfer contents of the graduated cylinder into an appropriate size amber bottle
8. Shake well to mix.

Notes:

- Mix 62.5 mL of Simple Syrup with 62.5 mL of methylcellulose 1%. Use mixture as base solution, shake well before each use.

References:

1. Nahata MC, Morosco RS, Hipple TF. Stabilitiy of pyrimethamine in a liquid dosage formulation stored for three monhts. Am J Health Syst Pharm 1997;54:2714-6.
2. Jew RK, Soo-Hoo W, Erush. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. American Society of Health System Pharmacists. Bethesda, MD. 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Quinidine**	**Shelf Life:**	60 days
Concentration:	10 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Protect from Light

Ingredients	QS	Quantity	Units
Quinidine 200 mg tablet		6	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Triturate tablets to a fine powder in a mortar and pestle
2. Levigate with a small amount of base solution to form a paste
3. Add base solution in increasing amounts while mixing thoroughly
4. Transfer the contents of the mortar to a graduated cylinder
5. Rinse the mortar and pestle with base solution and pour into graduated cylinder
6. Add base solution to the graduated cylinder to achieve the total volume of 120 ml
7. Transfer contents of the graduated cylinder into an appropriate size plastic amber bottle
8. Shake well to mix

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute base solution with cherry syrup alone
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. 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.
2. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part III. Secundum Artem. 6(2).
3. Jew RK, Soo-Hoo W, Erush. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. American Society of Health System Pharmacists. Bethesda, MD. 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Rifabutin**	**Shelf Life:**	84 days
Concentration:	20 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Rifabutin 150 mg capsule		16	Capsules
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Open capsules and empty contents into a mortar
2. Triturate contents to a fine powder
3. Levigate with a small amount of base solution to form a paste
4. Add base solution in increasing amounts while mixing thoroughly
5. Transfer contents of the mortar to a graduated cylinder
6. Rinse the mortar and pestle with base solution and pour into graduated cylinder
7. Add base solution to the graduated cylinder to achieve the total volume indicated above
8. Transfer contents of the graduated cylinder into an appropriate size plastic amber bottle
9. Shake well to mix

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May use cherry syrup in place of Ora-Sweet/Ora-Plus solution, with stability of 56 days

References:

1. Haslam JL, Edodage KL, Chen Y. et al. Stability of rifabutin in two extemporaneously compounded oral liquids. Am J Health Syst Pharm 1999;56(4): 333-6.
2. Jew RK, Soo-hoo W, Erush. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. American Society of Health System Pharmacists. Bethesda, MD. 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Rifaximin**	**Shelf Life:**	60 days
Concentration:	20 mg/mL	**Storage:**	Room Temperature
Volume:	60 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Rifaximin 200 mg tablet		6	Tablets
Ora-Plus/Ora-Sweet	Y	60	mL

Directions:

1. Triturate tablets into a fine powder in a glass mortar
2. Mix equal quantities of Ora-Plus and Ora-Sweet in geometric proportions with constant stirring to produce 60 mL
3. Using 30 mL of this mixture, levigate the powder into a smooth suspension, adding the vehicle in geometric proportions
4. Transfer the suspension to a 2-oz child-resistant amber prescription bottle
5. Rinse the mortar and pestle with sufficient vehicle to bring the final volume in the bottle to 60 mL

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend

References:

1. Nahata MC, Pai VB. Pediatric Drug Formulations. 6th ed. Harvey Whitney Books. Cincinnati, OH. 2011.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Rifampin**	**Shelf Life:**	56 days
Concentration:	10 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Rifampin 300 mg capsule		4	Capsules
Simple Syrup	Y	120	mL

Directions:

1. Empty the contents of four 300 mg capsules onto a piece of weighing paper
2. If necessary, crush contents to produce a fine powder
3. Transfer powder to a 4 ounce amber glass or plastic prescription bottle
4. Rinse paper and spatula with 20 mL of syrup and add the rinse to bottle. Shake vigorously.
5. Add 100 mL of syrup to the bottle and shake vigorously

Notes:

- Stable for 28 days room temperature

References:

1. Nahata MC, Pai VB, & Hipple TF. Pediatric Drug Formulations, 5th ed. Cincinnati OH: Harvey Whitney Books Co, 2004.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Sevelamer**	**Shelf Life:**	14 days
Concentration:	50 mg/mL	**Storage:**	Refrigerate
Volume:	240 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Sevelamer 800 mg tablet		15	Tablets
Distilled Water		120	mL
Simple Syrup	Y	240	mL

Directions:

1. Place 15 sevelamer tablets in a beaker and add 120 mL distilled water
2. Allow tablets to soak and disintegrate in the water for at least 30 minutes
3. Add a portion of simple syrup and mix until a uniform suspension
4. Pour into graduated cylinder
5. QS to 240 mL with simple syrup
6. Stir until uniform

Notes:

References:

1. McElhiney LF. Sevelamer suspension in children with end-stage renal disease. Int J Pharm Compd 2007.11(1):20-24.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Sodium Benzoate**	**Shelf Life:**	14 days
Concentration:	200 mg/mL	**Storage:**	Room Temperature
Volume:	300 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Sodium Benzoate Powder		60	Grams
Sterile Water	Y	300	mL

Directions:

1. Pour the sodium benzoate powder into a 500 mL conical graduatephar
2. Slowly add sterile/purified water to the graduate while continuously stirring
3. Pour enough water to reach a final volume of 300 mL
4. Stir until you have a uniform solution
5. Pour into a 16 ounce amber prescription bottle

Notes:

References:

1. U.S.P. on Compounding: A Guide for the Compounding Practitioner. Copyright 2013, The United States Pharmacopeial Convention (online version access at http://compounding.usp.org), <795> Pharmaceutical Compounding- Nonsterile Preparations, water-containing formulations

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Spironolactone**	**Shelf Life:**	28 days
Concentration:	5 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Spironolactone 50 mg tablet		12	Tablets
Purified Water		5	mL
Cherry Syrup	Y	120	mL

Directions:

1. Triturate tablets to a fine powder in a mortar and pestle
2. Levigate with 5 mL of purified water to form a paste
3. Add base solution in increasing amounts while mixing thoroughly
4. Transfer contents of the mortar to a graduated cylinder
5. Rinse the mortar and pestle with base solution and pour into graduated cylinder
6. Add base solution to the graduated cylinder to achieve total volume of 120 mL
7. Transfer contents of the graduated cylinder into an appropriate size glass amber bottle
8. Shake well to mix

Notes:

- May substitute Ora-Blend or Ora-Sweet SF if preferred with same expiration

References:

1. Mathur LK, Wickman A. Stability of extemporaneously compounded spironolactone suspensions. Am J Hosp Pharm 1989;46:2040-2042.
2. Jew RK, Soo-Hoo W, Erush. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. American Society of Health System Pharmacists. Bethesda, MD. 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Spironolactone/ Hydrochlorthiazide**	**Shelf Life:**	60 days
Concentration:	5/5 mg/mL	**Storage:**	Room Temperature or Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Uncoated Spironolactone/Hydrochlorothiazide 25/25 mg tablet		24	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Crush spironolactone/hydrochlorothiazide tablets in a mortar
2. Grind into a fine powder
3. Add approximately 25 mL of vehicle and mix to form a paste
4. Add additional vehicle in geometric portions, mix well
5. Transfer to graduated cylinder
6. Rinse mortar and pestle with small amount of vehicle and transfer to graduated cylinder
7. QS to 120 mL using vehicle
8. Transfer to plastic amber bottle

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with cherry syrup
- May substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Nahata MC, Pai VB and Hipple TF, Pediatric Drug Formulations, 6th Ed. Cincinnati, OH: Harvey Whitney Books Co. 2011.
2. Allen LV, Erickson MA. Stability of extemporaneously prepared pediatric formulations using ora-plus with ora-sweet and ora-sweet SF − Part II. Secundum Artem, 6(1).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**SulfaSALAzine**	**Shelf Life:**	90 days
Concentration:	100 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
SulfaSALAzine 500 mg tablet		20	Tablets
Ora-Plus/Ora-Sweet	Y	100	mL

Directions:

1. Place sulfasalazine tablets in a mortar and pour small amount of vehicle over tablets
2. Allow to soften for 20-30 minutes
3. Levigate to form a smooth paste
4. Add vehicle via geometric dilution, almost to volume, mixing thoroughly after each addition
5. Transfer to graduated cylinder
6. Rinse mortar and pestle with vehicle and transfer to graduated cylinder
7. QS to 100 mL with vehicle; pour in glass or plastic amber bottle and shake well

Notes:

- Do not use enteric coated tablets
- Will form thick, opaque, brownish-yellow suspension
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend

References:

1. Lingertat-Walsh K, Walker SE, Law S, et al. Stability of sulfasalazine oral suspension. Can J Hosp Pharm 2006; 59(4):194-200.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Tacrolimus**	**Shelf Life:**	120 days
Concentration:	1 mg/mL	**Storage:**	Room Temperature
Volume:	30 mL	**Auxiliary Labeling:**	Shake Well, Cytotoxic Material Handle Properly

Ingredients	QS	Quantity	Units
Tacrolimus 5 mg capsule		6	Capsules
Sterile Water		5	mL
Ora-Plus/Ora-Sweet	Y	30	mL

Directions:

1. Empty the contents of capsules into an amber bottle
2. Add 5 mL of sterile water and agitate bottle
3. Add 1:1 mixture of Ora-Plus/Ora-Sweet and QS to a total volume of 30 mL

Notes:

- Contact precautions required. Must be prepared in a biological safety cabinet or vertical air flow hood with proper personal protective equipment. Equipment can include double gloving, wearing a protective gown, and using a respiratory mask if preparation does not occur in a fume hood.
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend

References:

1. Elefante A, Muindi J, West K, et al. Long term stability of patient-convenient 1 mg/mL suspension of tacrolimus for accurate maintenance of stable therapeutic levels. Bone Marrow Transplant 2006;37(8):781-4.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Tadalafil**	**Shelf Life:**	91 days
Concentration:	5 mg/mL	**Storage:**	Room Temperature
Volume:	60 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Tadalafil 20 mg tablet		15	Tablets
Ora-Plus/Ora-Sweet	Y	60	mL

Directions:

1. Crush tablets and reduce to a fine powder
2. Add via geometric proportions to a fine powder and mix to form a smooth suspension
3. Transfer to amber plastic bottle
4. Rinse mortar with vehicle
5. QS to final volume of 60 mL with remaining vehicle

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend

References:

1. Pettit RS, Johnson CE, Caruthers RL. Stability of an extemporaneously prepared tadalfil suspension. Am J Health System Pharm 2012;69(7):502-4.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Temozolomide**	**Shelf Life:**	60 days
Concentration:	10 mg/mL	**Storage:**	Refrigerate
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate, Cytotoxic Material Handle Properly

Ingredients	QS	Quantity	Units
Temozolomide 100 mg capsule		10	Capsules
Povidone K-30		500	mg
Citric Acid Anhydrous		25	mg
Purified Water		1.5	mL
Ora-Plus/Ora-Sweet	Y	100	mL

Directions:

1. Using scale, separately measure Povidone K-30 and Citric acid anhydrous
2. Add citric acid anhydrous powder to purified water in a glass mortar. Allow to dissolve
3. Add contents of capsules plus Povidone K-30 powder to mortar. Triturate to form a uniform paste.
4. Add small amount of vehicle. Mix well.
5. Transfer to an amber bottle. Rinse mortar, at least 4 times, with small amounts of vehicle
6. QS to final desired volume with remaining vehicle

Notes:

- Contact precautions required. Must be prepared in a biological safety cabinet or vertical air flow hood with proper personal protective equipment.
- Stable for 7 days at room temperature
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend

References:

1. Trissel LA, Yamping Z, Koontz SE. Temozolomide stability in extemporaneously compounded oral suspensions. Int J Pharm Compounding 2006;10:396-9.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Terbinafine**	**Shelf Life:**	42 days
Concentration:	25 mg/mL	**Storage:**	Room Temperature
Volume:	200 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Terbinafine HCl 250 mg tablet		20	Tablets
Ora-Plus/Ora-Sweet	Y	200	mL

Directions:

1. Crush tablets into a fine powder with a mortar and pestle
2. Wet powder and levigate with a small amount of vehicle until a uniform paste is achieved
3. Continue to add small amounts of vehicle and triturate until a uniform mixture is achieved
4. Transfer this mixture to a 240 mL conical graduate
5. Rinse the mortar and pestle with vehicle and then transfer to the conical graduate
6. Once the mortar and pestle are clear, pour the remaining vehicle into the conical
7. Stir this suspension well with a glass stirring rod
8. Pour enough vehicle into the conical graduate to reach a volume of 200 mL
9. Stir well with the glass stirring rod and then pour into an amber prescription bottle

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend

References:

1. Abdel-Rahman SM and Nahata MC. Stability of terbinafine hydrochloride in an extemporaneously prepared oral suspension at 25 and 4 degrees Celsius. Am J Hosp Pharm 1999;56(3):243-5.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Tetracycline**	**Shelf Life:**	28 days
Concentration:	25 mg/ml	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Tetracycline 250 mg capsule		12	Capsules
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Open tetracycline capsules and empty contents into a mortar
2. Triturate contents to a fine powder
3. Levigate with a small amount of base solution to form a paste
4. Add base solution in increasing amounts while mixing thoroughly
5. Transfer contents of the mortar to a graduated cylinder
6. Rinse the mortar and pestle with base solution and pour into graduated cylinder
7. Add base solution to the graduated cylinder to achieve the total volume indicated above
8. Transfer content of the graduated cylinder into an appropriate size plastic amber bottle
9. Shake well to mix

Notes:

- May substitute Ora-Sweet/Ora-Plus with Ora-Blend.
- May substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF with expiration date of 10 days refrigerated and 7 days at room temperature

References:

1. Allen LV, Erickson MA. 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.
2. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part III. Secundum Artem. 6(2).
3. Jew RK, Soo-Hoo W, Erush SC. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. Bethesda, MD. American Society of Health System Pharmacists; 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Thioguanine**	**Shelf Life:**	63 days
Concentration:	20 mg/mL	**Storage:**	Room Temperature
Volume:	30 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Thioguanine 40 mg tablet		15	Tablets
Ora-Plus		10	mL
Ora-Sweet	Y	30	mL

Directions:

1. Crush the tablets and triturate to a fine powder
2. Wet the tablets with a small amount of Ora-Plus
3. Levigate until a smooth paste is formed
4. Add the rest of the Ora-Plus with continuous mixing and transfer to a graduate
5. Rinse mortar and pestle with Ora-Sweet, add to the graduate, and qs to final volume

Notes:

- May substitute methylcellulose solution 1% for suspending agent with simple syrup for flavoring agent

References:

1. Aliabadi HM, Romanick M, Somayaji V et al. Stability of compounded thioguanine oral suspensions. Am J Health-Syst Pharm 2011;68:900-8**.**

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Topiramate**	**Shelf Life:**	90 days
Concentration:	6 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	100 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Topiramate 100 mg tablet		6	Tablets
Ora-Plus/Ora-Sweet	Y	100	mL

Directions:

1. Triturate tablets to a fine powder in a mortar and pestle
2. Levigate with a small amount of base solution to form a paste
3. Add base solution in increasing amounts while mixing thoroughly
4. Transfer contents of the mortar to a graduated cylinder
5. Rinse the mortar and pestle with base solution and pour into graduated cylinder
6. Add base solution to graduated cylinder to achieve the total volume desired
7. Transfer contents of the graduated cylinder into an appropriate size plastic amber bottle
8. Shake well to mix

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May use substitute base solution of 10mL Methylcellulose 1% mixed with 87.5 mL simple syrup NF

References:

1. Nahata MC, Pai VB, and Hipple TF. Pediatric Drug Formulations. 5th ed, Cincinnati, OH: Harvey Whitney Books Co, 2004.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Tramadol**	**Shelf Life:**	90 days
Concentration:	5 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Tramadol 50 mg tablet		12	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Triturate tablets to a fine powder in a mortar and pestle
2. Levigate with a small amount of base solution to form a paste
3. Add base solution in increasing amounts while mixing thoroughly
4. Transfer contents of the mortar to a graduated cylinder
5. Rinse the mortar and pestle with base solution and pour into graduated cylinder
6. Add base solution to the graduated cylinder to achieve the total volume
7. Transfer contents of the graduated cylinder into an appropriate size plastic amber bottle
8. Shake well to mix

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May substitute base solution with 60 mL of Ora-Plus mixed with 60 mL of strawberry syrup
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Wagner DS, Johnson CE, Cichon-Hensely BK, et al. Stability of oral liquid preparations of tramadol in strawberry syrup and in a sugar-free vehicle. Am J Health Syst Pharm 2003;60:1268-70.
2. Jew RK Soo-Hoo W, Erush SC. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. Bethesda, MD. American Society of Health System Pharmacist; 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Ursodiol**	**Shelf Life:**	35 days
Concentration:	60 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	60 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Ursodiol 300 mg capsule		12	Capsules
Glycerin		Small	Amount
Simple Syrup	Y	60	mL

Directions:

1. Empty the contents of the capsules into a mortar and reduce to a fine powder
2. Add a small amount of glycerin to the powder and mix to form a uniform paste
3. Add geometric proportions of simple syrup almost to volume
4. Transfer to a graduate and QS to 60 mL with simple syrup while mixing

Notes:

- Study utilized plastic amber bottles for stability data

References:

1. Johnson CE, Nesbitt J. Stability of ursodiol in an extemporaneously compounded oral liquid. Am J Health Syst Pharm 1995;52(16):1798-1800.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Valacyclovir**	**Shelf Life:**	21 days
Concentration:	50 mg/mL	**Storage:**	Refrigerate
Volume:	180 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Valacyclovir 500 mg tablet		18	Tablets
Ora-Plus		40	mL
Ora-Sweet	Y	180	mL

Directions:

1. Tablets may be wiped with sterile water and sterile gauze to remove coating. Do not allow tablets to begin dissolving.
2. Triturate tablets to a fine powder in a mortar and pestle
3. Levigate with Ora-Plus to form a paste
4. Add base solution in increasing amounts while mixing thoroughly
5. Transfer contents of the mortar to a graduated cylinder
6. Rinse the mortar and pestle with base solution and pour into graduated cylinder
7. Add base solution to the graduated cylinder to achieve the total volume indicated above
8. Transfer contents of the graduated cylinder into an appropriate size glass amber bottle
9. Shake well to mix

Notes:

- May substitute base solution with Ora-Sweet SF
- Syrpalta may be used in place of Ora-Plus/Ora-Sweet mixture with extended stability of 35 days

References:

1. Fish DN, Vidaurri VA, Deeter RG. Stability of valacylcovir hydrochloride in extemporaneously prepared oral liquids. Am J Health Syst Pharm 1999;56:1957-1960.
2. Jew RK, Soo-Hoo W, Erush SC. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. Bethesda, MD. American Society of Health System Pharmacists. 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Verapamil**	**Shelf Life:**	60 days
Concentration:	50 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Verapamil 80 mg tablet		75	Tablets
Ora-Sweet/Ora-Plus	Y	120	mL

Directions:

1. Triturate tablets to a fine powder in a mortar and pestle
2. Levigate with a small amount of base solution to form a paste
3. Add base solution in increasing amounts while mixing thoroughly
4. Transfer contents of the mortar to a graduated cylinder
5. Rinse the mortar and pestle with base solution and pour into graduated cylinder
6. Add base solution to the graduated cylinder to achieve the total volume indicated above
7. Transfer contents of the graduated cylinder into an appropriate size plastic amber bottle
8. Shake well to mix

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora- Blend
- May substitute Ora-Plus/Ora-Sweet with cherry syrup
- May also substitute Ora-Plus/Ora-Sweet with Ora-Plus/Ora-Sweet SF

References:

1. Allen LV, Erickson MA. 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.
2. Jew RK, Soo-Hoo W, Erush SC. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. Bethesda, MD. American Society of Health System Pharmacists. 2010.
3. Paddock Laboratories. Stability of Extemporaneously Prepared Pediatric Formulations Using Ora-Plus with Ora-Sweet and Ora-Sweet SF – Part II. Secundum Artem. 6(1).

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Zonisamide**	**Shelf Life:**	28 days
Concentration:	10 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Protect from Light

Ingredients	QS	Quantity	Units
Zonisamide 100 mg capsule		12	Capsules
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Open capsules and empty contents into a mortar
2. Triturate contents to a fine powder
3. Mix Ora-Plus and Ora-Sweet together thoroughly in a glass mortar, in geometric proportions, to prepare the vehicle
4. Levigate with a small amount of vehicle to form a paste
5. Add vehicle in geometric proportions with constant mixing
6. Transfer to a graduate
7. Rinse the mortar with sufficient vehicle and transfer to graduate to make up the final volume

Notes:

- This formulation was stored in amber prescription bottles
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May also substitute Ora-Plus/Ora-Sweet with Simple Syrup, NSF with equivalent dating

References:

1. Abob CV, Wei B, Liang D. Stability of zonisamide in extemporaneously compounded oral suspensions. Am J Health Syst Pharm 2009;66:1105-9.

Alternative Formulations for Commercially Available Products / Compounding Kits

****The following preparations are only to be used when the commercially **** available product is unavailable for use or in other extenuating circumstances

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Doxycycline**	**Shelf Life:**	24 hours
Concentration:	5 mg/mL	**Storage:**	Room Temperature
Volume:	20 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Doxycyline 100 mg tablet		1	Tablet
Water		20	mL

Directions:

1. Add 20 mL of water to mortar with one doxycycline tablet
2. Allow tablet to soak in water for 5 minutes to soften
3. Crush tablet into a fine powder and stir until well mixed
4. May mix with drink of 15 mL of milk, chocolate milk, chocolate pudding, or apple juice

Notes:

References:

1. Public Health Emergency – Doxycycline Preparation Information page. U.S. Food and Drug Administration Web site. Available at: http://www.fda.gov/Drugs/EmergencyPreparedness/BioterrorismandDrugPreparedness/ucm249265.htm. Accessed July 16, 2016.

Gateway Pediatric Pharmacy Group Oral Liquid Compounds

Drug name:	**Enalapril**	**Shelf Life:**	91 days
Concentration:	1 mg/mL	**Storage:**	Refrigerate
Volume:	30 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Enalapril 10 mg tablet		3	Tablets
Distilled water		Small	Amount
Ora-Blend SF	Y	30	mL

Directions:

1. Crush tablets to a fine powder in a mortar
2. Wet with a small amount of water to form a uniform paste
3. Add Ora-Blend SF geometrically, mixing well
4. Transfer to an amber bottle. Rinse mortar with Ora-Blend SF
5. Add flavoring (if available) and then QS to desired final volume with remaining Ora-Blend SF

Notes:

- Stable 25 days at room temperature

References:

1. Nahata MC, Morosco RS, Hipple TF. Stability of enalapril maleate in three extemporaneously prepared oral liquids. Am J Health Syst. Pharm 1998; 55:1155-7.

Gateway Pediatric Pharmacy Group Standardized Oral Liquid Compounds

Drug name:	**Glycopyrrolate**	**Shelf Life:**	14 days
Concentration:	0.2 mg/mL	**Storage:**	Room temperature or Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Glycopyrrolate 1 mg tablet		24	tablets
Ora-Sweet/Ora-Plus	Y	120	mL

Directions:

1. Crush tablets in mortar
2. Add Ora-Sweet:Ora-Plus 1:1 mixture via geometric dilution until smooth suspension is obtained
3. Transfer to an amber bottle. Rinse mortar with Ora-Blend
4. QS to desired final volume with remaining Ora-Blend

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May substitute Simple Syrup, NF:methylcellulose 10:1 mixture for Ora-Plus/Ora-Sweet

References:

1. Nahata MC. Long-term stability of zonisamide, amitriptyline, and glycopyrrolate in extemporaneously prepared liquid-dosage forms at two temperatures. Int J Pharm Compd 2016;20(2):164-6.

Gateway Pediatric Pharmacy Group Standardized Oral Liquid Formulations

Drug name:	**Isoniazid**	**Shelf Life:**	21 days
Concentration:	10 mg/mL	**Storage:**	Refrigerate
Volume:	30 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Isoniazid 100 mg tablet		3	Tablets
Distilled Water		3	mL
70% Sorbitol solution	Y	30	mL

Directions:

1. Triturate tablets in a mortar with distilled water
2. Transfer to an amber bottle. Rinse mortar with 70% sorbitol solution.
3. QS to final desired volume with remaining 70% sorbitol solution

Notes:

- Do **not** use sugar based solutions

References:

1. Nahata MC, Pai VB. Pediatric Drug Formulations. 3rd ed. Harvey Whitney Books. Cincinnati, OH, 1998.

Gateway Pediatric Pharmacy Group Oral Liquid Compounds

Drug name:	**Lansoprazole**	**Shelf Life:**	7 days
Concentration:	3 mg/mL	**Storage:**	Refrigerate
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Lansoprazole 30 mg capsule		10	Capsules
Sodium Bicarbonate 8.4 % solution		100	mL

Directions:

1. Empty contents of capsules into a beaker
2. Add 100 mL of sodium bicarbonate and gently stir until dissolved (30 minutes)
3. Transfer solution to an amber bottle

Notes:

- Sugar-free formulation for ketogenic diet

References:

1. Morrison JT, Lugo RA, Thigpen JC, Brown SD. Stability of extemporaneously prepared lansoprazole suspension at two temperatures. J Pediatr Pharmacol Ther 2013;18(2):122-7.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Omeprazole**	**Shelf Life:**	30 days
Concentration:	2 mg/mL	**Storage:**	Refrigerate
Volume:	60 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Omeprazole 20 mg capsule		6	Capsules
Sodium Bicarbonate 8.4% solution	Y	60	mL

Directions:

1. Empty the contents of 6 capsules into a 60 mL amber prescription bottle
2. QS to 60 mL with sodium bicarbonate. Allow enteric coating to dissolve and break down.
3. When fully dissolved, shake well and label bottle

Notes:

- Stable 14 days at room temperature
- Sugar-free formulation for ketogenic diet

References:

1. Quercia R, Fan C, Liu X, et al. Stability of omeprazole in an extemporaneously prepared oral liquid. Am J Health Syst Pharm 1997;54(16):1833-6.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Oseltamivir**	**Shelf Life:**	35 days
Concentration:	6 mg/mL	**Storage:**	Refrigerate
Volume:	150 mL	**Auxiliary Labeling:**	Shake Well, Refrigerate

Ingredients	QS	Quantity	Units
Oseltamivir 75 mg capsule		12	Capsules
Water		10	mL
Cherry Syrup		137	mL

Directions:

1. Place water into a plastic or glass amber bottle
2. Carefully separate the capsules and pour the contents into the bottle. Weighing paper may also be used to hold capsule contents for ease of transfer.
3. Gently swirl the suspension to ensure adequate wetting of the powder for at least 2 minutes
4. Slowly add vehicle to the bottle
5. Close the bottle and shake well for 30 seconds to completely dissolve the active drug
6. Once dissolved, mix gently to avoid air entrapment and inaccurate dosing due to excessive air bubbles

Notes:

- Stable for 5 days at room temperature
- May also use Ora-Sweet SF or Simple Syrup in place of cherry syrup

References:

1. Emergency Compounding page. Tamiflu (oseltamivir phosphate) Web site. Available at: http://www.tamiflu.com/hcp/resources/hcp_resources_pharmacists#8cAodPwHqdEDibW3.97. Accessed July 18, 2016.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Rufinamide**	**Shelf Life:**	90 days
Concentration:	40 mg/mL	**Storage:**	Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Rufinamide 200 mg tablet		24	Tablets
Ora-Plus		60	mL
Ora-Sweet SF	Y	120	mL

Directions:

1. Crush tablets in mortar and reduce to a fine powder
2. Add 60 ml of Ora-Plus in incremental portions until a smooth suspension is obtained
3. Mix well while adding 60 ml of Ora-Sweet SF, QS to final volume of 120 mL
4. Transfer to a calibrated bottle

Notes:

- May substitute FlavorSweet-SF for Ora-Sweet SF

References:

1. Hutchinson DJ, Liou Y, Best R, et al. Stability of extemporaneous prepared rufinamide oral suspensions. Ann Pharmacother 2010; 44(3):462-5.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Sildenafil**	**Shelf Life:**	91 days
Concentration:	2.5 mg/mL*	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Sildenafil 100 mg tablet		3	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Triturate tablets to a fine powder in a mortar and pestle
2. Levigate with a small amount of base solution to form a paste
3. Add base solution in increasing amounts while mixing thoroughly
4. Transfer contents of the mortar to a graduated cylinder
5. Rinse the mortar and pestle with base solution and pour into graduated cylinder
6. Add base solution to the graduated cylinder to achieve total volume of 120 mL
7. Transfer contents of the graduated cylinder into an appropriate size plastic amber bottle
8. Shake well to mix

Notes:

* Different concentration than the commercially available product
- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May substitute base solution with 60 mL methylcellulose 1% mixed with simple syrup NF

References:

1. Nahata MC, Morosco RS, Brady MT. Extemporaneous sildenafil citrate oral suspensions for the treatment of pulmonary hypertension in children. Am J Health Syst Pharm 2006;63:254-7
2. Jew RK, Soo-Hoo W, Erush. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. American Society of Health System Pharmacists. Bethesda, MD, 2010.

Gateway Pediatric Pharmacy Group Oral Liquid Formulations

Drug name:	**Sotalol**	**Shelf Life:**	90 days
Concentration:	5 mg/mL	**Storage:**	Refrigerate or Room Temperature
Volume:	120 mL	**Auxiliary Labeling:**	Shake Well

Ingredients	QS	Quantity	Units
Sotalol 120 mg tablet		5	Tablets
Ora-Plus/Ora-Sweet	Y	120	mL

Directions:

1. Triturate tablets to a fine powder in a mortar and pestle
2. Levigate with a small amount of base solution to form a paste
3. Add base solution in increasing amounts while mixing thoroughly
4. Transfer contents of the mortar to a graduated cylinder
5. Rinse the mortar and pestle with base solution and pour into graduated cylinder
6. Add base solution to the graduated cylinder to achieve total volume of 120 mL
7. Transfer contents of the graduated cylinder into an appropriate size plastic amber bottle
8. Shake well to mix

Notes:

- May substitute Ora-Plus/Ora-Sweet with Ora-Blend
- May substitute base solution with 108 mL Simple Syrup NF mixed with 12 ml Methylcellulose 1%.

References:

1. Nahta MC, Morosco RS. Stability of sotalol in two liquid formulations at two temperatures. Ann Pharmacother 2003;137:506-9.
2. Jew RK Soo-Hoo W, Erush SC. Extemporaneous Formulations for Pediatric, Geriatric, and Special Needs Patients. 2nd ed. Bethesda, MD, 2010.