Extemporaneous FORMULATION

Pharmaceutical Services Division
Ministry of Health Malaysia

PHARMACEUTICAL SERVICES DIVISION
Ministry of Health Malaysia

Extemporaneous FORMULATION

Pharmaceutical Services Division
Ministry of Health Malaysia
Lot 36, Jalan Universiti,
46350 Petaling Jaya, Selangor.
Tel: 03-78413200 Fax: 03-79682222/79682268

Extemporaneous Formulation, MOH 2015
Pharmaceutical Services Division,
Ministry of Health Malaysia
Lot 36, Jalan Universiti,
46350 Petaling Jaya, Selangor.

Previous edition was Extemporaneous Formulary MOH 2012.

Perpustakaan Negara Malaysia
Extemporaneous Formulation, Ministry of Health Malaysia.

ISBN 978-967-5570-65-0

9 789675 570650

PHARMACEUTICAL SERVICES DIVISION
Ministry of Health Malaysia

Extemporaneous FORMULATION

CONTENTS

INTRODUCTION

Compounding of pharmaceutical formulations remain as the core skill of pharmacists and this manual is produced to include well referenced recipes that are easy to prepare, use readily available ingredients, have the longest expiry date possible and when necessary, provide more than one strength of formulation to accommodate the unique needs of different groups of patients.

Efforts have been made to search for substantiated references in producing this manual of extemporaneous preparations. However, the lists of compounded items in this manual are not exhaustive. Preparations included in the manual are for ingredients available commercially but not in the required dosage form for therapy and thus, necessitate extemporaneous preparations.

The committee has made all reasonable efforts to confirm the accuracy of the information contained in the manual and to present the best practices as identified at the time of its completion. Formulations are only included where there is existence of published formulations and associated stability data.

The use of this manual requires knowledge based interpretation by healthcare professionals and is intended solely for use by pharmacists in healthcare facilities. All information contained in the manual has been provided with the sole intention that it be readily accessible for pharmacist's information and as a guide for preparing extemporaneous preparations that may be prescribed.

OBJECTIVE

To standardise formulations of extemporaneous preparations and practice in healthcare facilities.

POLICY

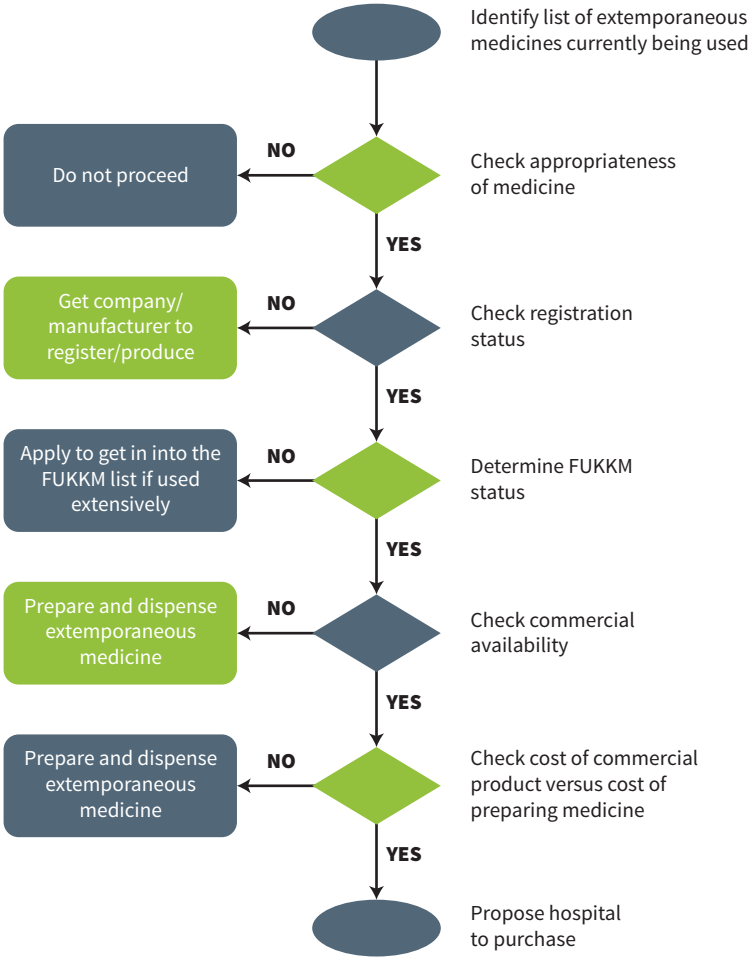
1. Always consider the use of commercially available products as far as possible.
2. If no suitable commercial product exists, consider a therapeutic alternative that is available in a suitable dosage form. This must be discussed with the physician.
3. Extemporaneous preparations should be done based on evidence-based references.
4. Always check for the suitability of the product/brand for extemporaneous preparations.
5. Preparations listed in this manual should be done according to what is stated as far as possible unless stated otherwise in the product leaflet.
6. When no information is available, compound an oral medication by dispensing a tablet and/or capsule and directing the caregiver to mix just prior to administration.
7. Stability stated in this manual is applicable for shelf storage in the pharmacy without opening. Once opened, the stability of the preparation should be no longer than 30 days. Maximum quantity of the extemporaneous preparations to be dispensed should not exceed one month.
8. Refrain assumptions on the therapeutic equivalence in the case of suggesting alternative agents as the possibilities and supporting data may be limited.
9. Techniques in compounding preparations and manipulations should always be in line with the standard Good Preparation Practice as delivering an accurate dose is paramount.
10. Staff and facilities are challenged to undertake intermittent competency assessments in order to achieve the standards requirement.
11. Documentation after each preparation should include details on the materials used, processes involved and the responsible personnel in charge.

CONSIDERATIONS FOR PREPARING EXTEMPORANEOUS COMPOUNDS

1. Pharmacy personnel are reminded not to empirically change flavourings or suspending agents because they can affect the pH and stability of the product and result in an unstable product.
2. Please consider ingredients in the formulations that require special precautions in neonates.
3. Mixing of a compounded formulation should always be in line with the following principles:
   a. Ensure that all ingredients used are within the expiry date.
   b. Ensure that all utensils are clean; including mortar and pestle, graduates, pill cutters and stirring rods.
   c. Product should be labelled clearly and stored as recommended within the formula.
   d. For solution or suspension products, emphasise on the importance of thorough shaking before administration.
4. If compounding a preparation using contents from an ampoule, remember to withdraw the solution (medication) from the ampoule using a filter needle to ensure no glass particles are incorporated into the compound.
5. Place tablet(s) within mortar and pestle to grind tablets to a fine powder. For film-coated tablets, it may be necessary to add a small amount of diluents such as water, to soften the coating prior to grinding the tablets. This will ensure that the compound will not have an eggshell appearance from the film coating floating throughout the suspension. If you are using capsules, open the capsule and empty the powder into the mortar and discard the capsule shell.
6. Solutions will have a clearer appearance versus a compounded suspension.

7. Manipulations of the available dosage forms in order to fulfil the unusual practitioner's request may impose risks such as preparation and administration errors as well as unpredictable bioavailability, compatibility and stability profile.
8. Understand the roles of excipients in certain formulations and consider their risks over benefits limitation.
9. If distilled water is not available, water for injection can be used as a substitution, and vice versa.

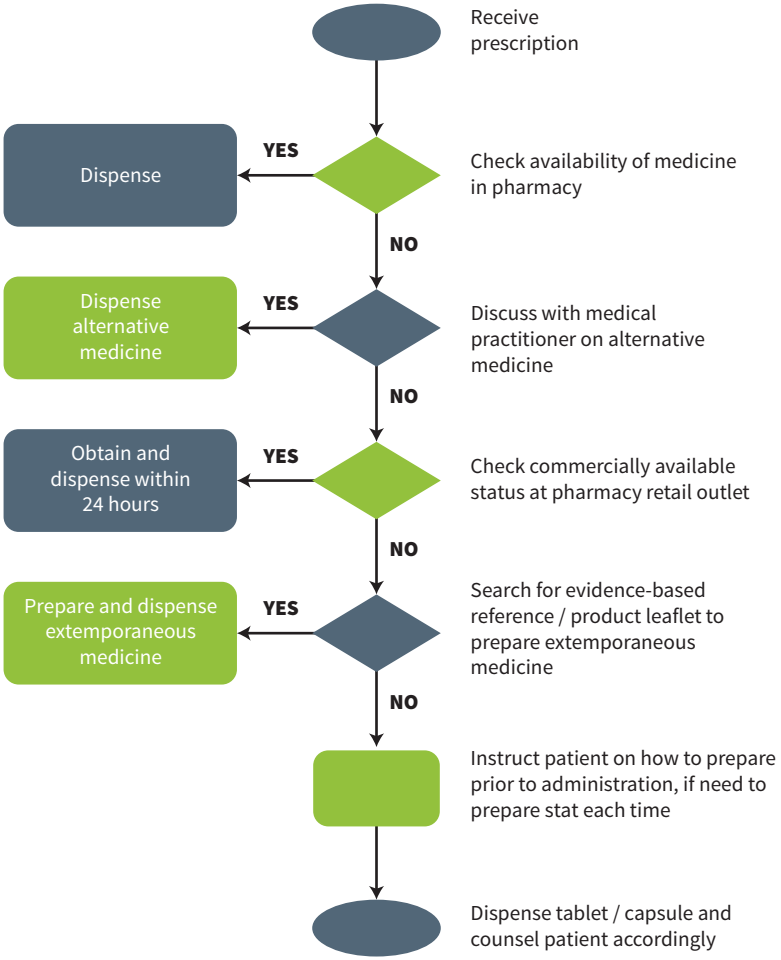
WORK FLOW CHART 1:
SOURCING THE COMPOUNDING FORMULARY LIST OF EXTEMPORANEOUS PREPARATION MEDICINES



CHECKLIST 1:
SOURCING THE COMPOUNDING FORMULARY LIST OF EXTEMPORANEOUS PREPARATION MEDICINES

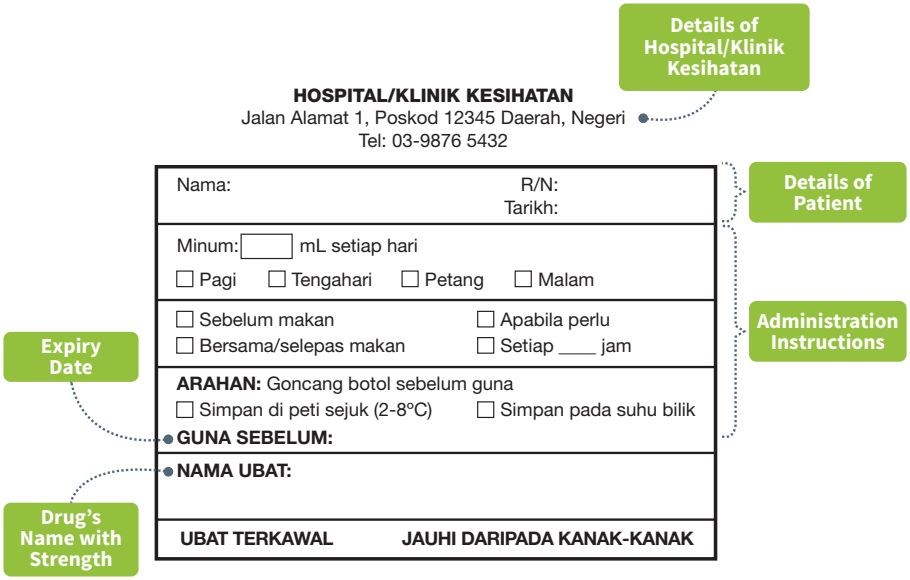
NO	ACTION	TICK (√)	NOTE
1.	Identify list of extemporaneous medicines currently being used		
2.	Check appropriateness of medicine		
3.	Check registration status		
4.	Determine FUKKM status		
5.	Check commercial availability		
6.	Check cost of commercial product versus cost of preparing medicine		
7.	Propose hospital to purchase		

WORK FLOW CHART 2:
HANDLING OF PRESCRIPTIONS WITH EXTEMPORANEOUS PREPARATION MEDICINES IN THE PHARMACY



STANDARD LABEL DESIGN & WORKSHEET REQUIREMENTS FOR EXTEMPORANEOUS PREPARATIONS

The proposed label for extemporaneous preparations must have the information as shown below:



The worksheet of the product should contain the following details:

- Patient's name
- ID number
- Prescription number
- Date of preparation
- Name of drug
- Dose
- Volume of diluent/vehicle
- Batch number of preparations & starting materials
- Name and signature of preparing personnel
- Name and signature of checking personnel

CHECKLIST 2:
HANDLING OF PRESCRIPTIONS WITH EXTEMPORANEOUS PREPARATION MEDICINES IN THE PHARMACY

NO	ACTION	TICK (√)	NOTE
1.	Receive prescription		
2.	Check availability of medicine		
3.	Discuss with medical practitioner on alternative medicine		
4.	Check commercially available status at retail pharmacy outlet		
5.	Search for evidence-based reference to prepare extemporaneous medicine		
6.	Instruct patient/caregiver on how to prepare prior to administration of medicine, if needed to prepare stat each time		
7.	Dispense medicine and counsel patient/caregiver accordingly		

1. ACETAZOLAMIDE SUSPENSION 25MG/ML

Generic Name : Acetazolamide
Indication : Reduction of intra-ocular pressure in open-angle glaucoma, secondary glaucoma and peri-operatively in angle-closure glaucoma
Dosage Form : Suspension
Strength : 25mg/mL
Stability : 60 days
Storage : Refrigerate (preferable) or at room temperature

INGREDIENTS	STRENGTH	QUANTITY
Acetazolamide	250mg	12 tablets
Vehicle	qs	120mL

VEHICLE OF CHOICE:
- Ora-Sweet® : Ora-Plus® (1:1) or
- Ora-Sweet SF® : Ora-Plus®(1:1) or
- Ora-Blend SF® or
- Cherry syrup or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

REFERENCES:
1. Allen LV, Erickson MA.(1996) Stability of acetazolamide allopurinol, azathioprine, clonazepam, and flucytosine in extemporaneously compounded oral liquids. *Am J Health Sys Pharm*. 53:1944.

2. ALLOPURINOL SUSPENSION 20MG/ML

Generic Name : Allopurinol
Indication : Gout or uric acid and calcium oxalate renal stones
Dosage Form : Suspension
Strength : 20mg/mL
Stability : 60 days
Storage : Refrigerate (preferable) or at room temperature

INGREDIENTS	STRENGTH	QUANTITY
Allopurinol	300mg	8 tablets
Vehicle	qs	120mL

VEHICLE OF CHOICE:

- Ora-Sweet® : Ora-Plus® (1:1) or
- Ora-Sweet SF® : Ora-Plus®(1:1) or
- Ora-Blend® or
- Ora-Blend SF® or
- Cherry syrup or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)
- Methylcellulose 1% : Simple Syrup (1:1)

PROCEDURE:

1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

REFERENCES:

1. Allen LV and Erickson MA. Stability of Acetazolamide, Allopurinol, Azathioprine, Clonazepam, and Flucytosine in Extemporaneously Compounded Oral Liquids. Am J Health Sys Pharm 1996;53:1944-9.
2. Dressman JB and Poust RI. Stability of Allopurinol and five antineoplastics in suspension. Am J Hosp Pharm 1983; 40 (4): 616-8.

3. ALPRAZOLAM SUSPENSION 1MG/ML

Generic Name : Alprazolam
Indication : Anxiety disorders
Dosage Form : Suspension
Strength : 1mg/mL
Stability : 60 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Alprazolam	1mg	60 tablets
Vehicle	qs	60mL

VEHICLE OF CHOICE:

- X-Temp® Oral Suspension System

PROCEDURE:

1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

REFERENCES:

1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.
2. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

4. AMIODARONE SUSPENSION 40MG/ML

Generic Name : Amiodarone
Indication : Arrhythmias
Dosage Form : Suspension
Strength : 40mg/mL
Stability : 28 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Amiodarone	200mg	20 tablets
Sodium Bicarbonate	-	~10mL
Vehicle	qs	100mL

VEHICLE OF CHOICE:
- X-Temp® Oral Suspension System

PROCEDURE:
1. Measure out the vehicle and adjust the pH to pH 6-7 using Sodium Bicarbonate 5% solution.
2. Grind the tablets to fine powder in a mortar and levigate the powder using a small amount of vehicle (pH adjusted) to form smooth paste.
3. Gradually add the vehicle (pH adjusted) in small amounts to the paste, mix well until liquid is formed and transfer into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and add to the container.
5. Make up the final volume using more vehicle (pH adjusted) and stir well.
6. Shake well and label.

NOTES:
1. Shake the bottle before consume.

REFERENCES:
1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

5. AMLODIPINE SUSPENSION 1MG/ML

Generic Name : Amlodipine
Indication : Hypertension
Dosage Form : Suspension
Strength : 1mg/mL
Stability : 30 days
Storage : Refrigerate

INGREDIENTS	STRENGTH	QUANTITY
Amlodipine	10mg	6 tablets
Distilled water	-	3-4mL
Vehicle	qs	60mL

VEHICLE OF CHOICE:
- X-Temp® Oral Suspension System

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Add 3-4mL of distilled water to disintegrate the tablets.
3. Levigate the powder with small amount of vehicle until smooth paste is formed.
4. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
5. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
6. Make up to final volume with vehicle.
7. Shake well and label.

NOTES:

REFERENCES:
1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.
2. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

6. ATENOLOL SUSPENSION 2MG/ML

Generic Name : Atenolol
Indication : Hypertension, angina pectoris, myocardial infarction and arrhythmias
Dosage Form : Suspension
Strength : 2mg/mL
Stability : 14 days or 90 days
Storage : Refrigerate

INGREDIENTS	STRENGTH	QUANTITY
Atenolol	100mg	1 tablet
Glycerin	-	2mL
Vehicle	qs	50mL

VEHICLE OF CHOICE:
- Simple Syrup (stability 14 days) or
- Ora-Sweet® (stability 14 days) or
- Ora-Sweet SF® (stability 90 days)

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with glycerin until smooth paste is formed.
3. Add vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Ora-Sweet SF® should not be used in neonates ≤28 days corrected age.

REFERENCES:
1. Patel D, Doshi DH, Desia A. Short term stability of Atenolol in oral liquid formulations. International Journal of Pharmaceutical Compounding 1997; 437-439.
2. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

7. BACLOFEN SUSPENSION 5MG/ML

Generic Name : Baclofen
Indication : Spasticity of the skeletal muscle
Dosage Form : Suspension
Strength : 5mg/mL
Stability : 35 days
Storage : Refrigerate and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Baclofen	10mg	30 tablets
Glycerine	-	3mL
Simple Syrup	qs	60mL

PROCEDURE:

1. Grind tablets in a mortar to fine powder.
2. Add glycerin to make fine paste.
3. Add about 15ml of simple syrup to the paste, triturate well and transfer the contents into a graduated cylinder.
4. Rinse the mortar with about 15ml of simple syrup and transfer the contents into the graduated cylinder.
5. Repeat the last step as necessary to bring the final volume to 60ml.

NOTES:

1. Keep in an amber glass bottle.

REFERENCES:

1. Johnson CE and Hart SM. Stability of an Extemporaneously Compounded Baclofen Oral Liquid. Am J Hosp Pharm 1993;50(11):2353-5.
2. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

8. BACLOFEN SUSPENSION 10MG/ML

Generic Name : Baclofen
Indication : Spasticity of the skeletal muscle
Dosage Form : Suspension
Strength : 10mg/mL
Stability : 60 days
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Baclofen	10mg	120 tablets
Vehicle	qs	120mL

VEHICLE OF CHOICE:
- Ora-Sweet® : Ora-Plus® (1:1) or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)
- X-Temp® Oral Suspension System

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

REFERENCES:
1. Allen LV and Erickson MA. Stability of Acetazolamide, Allopurinol, Azathioprine, Clonazepam, and Flucytosine in Extemporaneously Compounded Oral Liquids. Am J Health Sys Pharm 1996;53:1944-9.
2. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

9. CAFFEINE CITRATE SOLUTION 10MG/ML

Generic Name : Caffeine Citrate
Indication : Apnoea of prematurity
Dosage Form : Solution
Strength : 10mg/mL
Stability : 30 days
Storage : Refrigerate and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Caffeine Citrate Anhydrous BP	-	1g
Citric acid anhydrous BP	-	1g
Vehicle	qs	100mL

VEHICLE OF CHOICE:

- Distilled water or water for injection

PROCEDURE:

1. Weigh the powders and mix with a small amount of vehicle in a measuring cylinder.
2. Add more vehicle to the mixture and make up to final volume with the vehicle.
3. Make up to final volume with vehicle and transfer into a suitable container.
4. Shake well and label.

NOTES:

1. Chemically stable for at least 90 days but the potential for microbial growth was not assessed.
2. Refrigeration recommended to reduce potential for micobial growth. Observe for precipitation.
3. Equivalent to 5mg per mL anhydrous caffeine base.
4. Shake well before consume.

REFERENCES:

1. Hopkin C, Taylor A, Hanson S.(1990) Stability study of caffeine citrate.Br J Pharm Pract.4: 133.
2. PharmInfoTech: Database of Oral Liquid Formulations-eMixt. [Online] Available from: http://www.pharminfotech.co.nz/manual/Formulation/mixtures/caffeine_citrate.html [Accessed:15th Oct 2015].
3. Nahata MC, Pai VB, Hipple TF. (2011) Pediatric Drug Formulation.6th Edition. Harvey Whitney Books.

10. CAPTOPRIL SYRUP 1MG/ML

Generic Name : Captopril
Indication : i) Hypertension ii) Congestive heart failure
iii) Post-myocardial infarction iv) Diabetic nephropathy
Dosage Form : Syrup
Strength : 1mg/mL
Stability : 30 days
Storage : Refrigerate and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Captopril	25mg	4 tablets
Simple Syrup	qs	100mL

PROCEDURE:

1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with simple syrup until smooth paste is formed.
3. Add more simple syrup to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

1. Keep in an amber glass bottle.

REFERENCES:

1. Lye MY, Yow KL, Lim LY, et al.(1997) Effects of Ingredients on Stability of Captopril in Extemporaneously Prepared Oral Liquids. Am J Health Syst Pharm .54(21):2483-7.
2. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

11. CAPTOPRIL SOLUTION 1MG/ML

Generic Name : Captopril
Indication : i) Hypertension ii) Congestive heart failure
iii) Post-myocardial infarction iv) Diabetic nephropathy
Dosage Form : Solution
Strength : 1mg/mL
Stability : 56 days
Storage : Refrigerate

INGREDIENTS	STRENGTH	QUANTITY
Captopril	25mg	4 tablets
Ascorbic Acid	500mg	1 tablet
Distilled Water	qs	100mL

PROCEDURE:

1. Allow the captopril tablets to dissolve in 50mL of distilled water in a graduated cylinder.
2. Add 500mg of ascorbic acid tablet to the mixture and make to final volume with distilled water.
3. Shake well and label.

NOTES:

1. A sulfur like odour is not indicative of captopril degradation.

REFERENCES:

1. Nahata MC, Morosco RS, and Hipple TF. (1994) Stability of Captopril in Liquid Containing Ascorbic Acid or Sodium Ascorbate. Am J Hosp Pharm. 51(13):1707-8.
2. Paddock Laboratories. Need for Extemporaneous Formulations in Pediatric Patients. Secundum Artem (Vol 8) No 3.

12. CARBIDOPA/LEVODOPA (SINEMET®) SUSPENSION 1.25MG CARBIDOPA/5MG LEVODOPA/ML

Generic Name : Carbidopa/Levodopa (Sinemet®)
Indication : Parkinson's disease
Dosage Form : Suspension
Strength : 1.25mg Carbidopa/5mg Levodopa/mL
Stability : 42 days if refrigerated or 28 days at room temperature
Storage : Refrigerate (preferred) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Sinemet ®	25mg/100mg	5 tablets
Vehicle	qs	100 mL

VEHICLE OF CHOICE:
- Ora-Sweet® : Ora-Plus® (1:1) or
- Ora-Blend ® or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Suspension stored at room temperature may change colour to darker yellow.

REFERENCES:
1. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

13. CARVEDILOL SUSPENSION 0.5MG/ML

Generic Name : Carvedilol
Indication : Treatment of stable moderate to severe congestive cardiac failure in addition to ACE inhibitors and diuretics
Dosage Form : Suspension
Strength : 0.5 mg/mL
Stability : 30 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Carvedilol	12.5mg	4 tablets
Vehicle	qs	100mL

VEHICLE OF CHOICE:
- Ora-Sweet®: Ora-Plus® (1:1) or
- Ora-Blend ® or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Keep in an amber glass bottle.

REFERENCES:
1. Nationwide Children's. Compounding Formulas.[Online] Available from: http://www.nationwidechildrens.org/outpatient-pharmacy-compounding-formulas. [Accessed: 9th Oct 2015].

14. CARVEDILOL SUSPENSION 1MG/ML

Generic Name : Carvedilol
Indication : Treatment of stable moderate to severe congestive cardiac failure in addition to ACE inhibitors and diuretics
Dosage Form : Suspension
Strength : 1mg/mL
Stability : 84 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Carvedilol	12.5mg	8 tablets
Sterile water for injection	-	10mL
Vehicle	qs	100mL

VEHICLE OF CHOICE:
- Ora-Sweet® : Ora-Plus®(1:1) or
- Ora-Blend ® or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with 10mL of sterile water for injection until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Keep in an amber glass bottle.

REFERENCES:
1. Yamreudeewong W, Dolence EK, Pahl D.(2006) Stability of two extemporaneously prepared oral metoprolol and carvedilol liquids. *Hosp Pharm*. 41:254–9.
2. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

15. CHLOROQUINE SUSPENSION 15MG/ML

Generic Name : Chloroquine
Indication : Treatment of malaria - acute attack
Dosage Form : Suspension
Strength : 15mg/mL
Stability : 60 days
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Chloroquine	250mg	6 tablets
Vehicle	qs	100mL

VEHICLE OF CHOICE:

- Ora-Sweet® : Ora-Plus® (1:1) or
- Ora-Sweet SF® : Ora-Plus® (1:1) or
- Ora-Blend ® or
- Ora-Blend SF® or
- Cherry syrup or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:

1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

1. Provides 9mg/mL of chloroquine base.
2. Keep in an amber plastic bottle.
3. Ora-Sweet SF® and Ora-Blend SF® should not be used in neonates ≤28 days corrected age.

REFERENCES:

1. Nahata MC, Pai VB, Hipple TF. (2011) *Pediatric Drug Formulation*. 6th Edition. Harvey Whitney Books.
2. Pharmacy Compounding Manual 2011, Alberta Health Services.

16. CITRIC ACID 25%

Generic Name : Citric Acid
Dosage Form : Solution
Strength : 25% (0.25g/mL)
Stability : 60 days
Storage : Refrigerate

INGREDIENTS	STRENGTH	QUANTITY
Citric acid powder, monohydrate	-	12.5g
Distilled water	qs	50mL

PROCEDURE:
1. Weigh the citric acid.
2. Add approximately 30mL of distilled water and stir well.
3. Make up to final volume of 50mL.

NOTES:
1. Bottle or container must not have rubber cap liners.

REFERENCES:
1. Pharmacy Compounding Manual 2011, Alberta Health Services.

17. CLONAZEPAM SUSPENSION 0.1MG/ML

Generic Name : Clonazepam
Indication : i) Epilepsy ii) Non-epileptic myoclonus
Dosage Form : Suspension
Strength : 0.1mg/mL
Stability : 60 days
Storage : Refrigerate or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Clonazepam	2mg	6 tablets
Vehicle	qs	120mL

VEHICLE OF CHOICE:
- Ora-Blend® or Ora-Blend SF® or
- Ora-Plus®: Ora-Sweet® (1:1) or
- Ora-Plus®: Ora-Sweet SF (1:1) Cherry Syrup or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Grind up tablets in mortar.
2. Levigate powders with small amount of vehicle until homogenous.
3. Make up to the final volume using vehicle.

NOTES:
1. Keep in an amber glass bottle. Clonazepam solutions should not be stored in polyvinyl chloride (plastic) bottle or polypropylene (oral syringes) for longer than 24 hours.
2. Ora-Sweet SF® and Ora-Blend SF® should not be used in neonates ≤28 days corrected age.

REFERENCES:
1. Pharmacy Compounding Manual 2011, Alberta Health Services.

18. CLOPIDOGREL SUSPENSION 5MG/ML

Generic Name : Clopidogrel
Indication : Prevention of myocardial infarction, stroke or established peripheral arterial disease
Dosage Form : Suspension
Strength : 5mg/mL
Stability : 60 days
Storage : Refrigerate or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Clopidogrel	75mg	8 tablets
Vehicle	qs	120mL

VEHICLE OF CHOICE:
- X-Temp® Oral Suspension System

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Keep in an amber plastic bottle.
2. Shake well before consume.

REFERENCES:
1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

19. DAPSONE SUSPENSION 2MG/ML

Generic Name : Dapsone
Indication : Leprosy, Dermatitis herpetiformis
Dosage Form : Suspension
Strength : 2mg/mL
Stability : 91 days
Storage : Refrigerate or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Dapsone	100mg	2 tablets
Vehicle	qs	100mL

VEHICLE OF CHOICE:
- Ora-Blend® or Ora-Blend SF® or
- Ora-Plus® : Ora-Sweet® (1:1) or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Preparation may slightly darken at room temperature.
2. Ora-Blend SF® should not be used in neonates ≤28 days corrected age.

REFERENCES:
1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.
2. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

20. DEXAMETHASONE SUSPENSION 0.5MG/ML

Generic Name : Dexamethasone
Indication : Croup, Septic shock, cerebral oedema and respiratory distress syndrome
Dosage Form : Suspension
Strength : 0.5mg/mL
Stability : 91 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Dexamethasone (Sodium Phosphate Injection)	4mg/mL	12.5mL
Vehicle	qs	100mL

VEHICLE OF CHOICE:
- X-Temp® Oral Suspension System

PROCEDURE:
1. Draw up the required amount of injection using a 5µm filter needle or filter straw and transfer to a measuring cylinder.
2. Add the sufficient quantity of vehicle and stir well.
3. Make up to final volume with vehicle.
4. Shake well and label.

NOTES:
1. Keep in an amber bottle.

REFERENCES:
1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

21. DIPYRIDAMOLE SUSPENSION 10MG/ML

Generic Name : Dipyridamole
Indication : As an adjunct to oral anticoagulation/antiplatelet therapy
Dosage Form : Suspension
Strength : 10mg/mL
Stability : 60 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Dypiridamole	25mg	40 tablets
Vehicle	qs	100mL

VEHICLE OF CHOICE:
- X-Temp® Oral Suspension System

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

REFERENCES:

1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

22. ENALAPRIL SUSPENSION 0.1MG/ML

Generic Name : Enalapril
Indication : i) Hypertension ii) Congestive heart failure
Dosage Form : Suspension
Strength : 0.1mg/mL
Stability : 14 days
Storage : Room temperature

INGREDIENTS	STRENGTH	QUANTITY
Enalapril	10 mg	5 tablets
Distilled water	qs	500mL

PROCEDURE:

1. Crush tablets in a mortar to make fine powders.
2. Levigate powders with small amount of distilled water until homogenous.
3. Add more distilled water to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

REFERENCES:

1. Saulnier JL, Schlatter J. (1997) Stability of enalapril solutions from tablets in sterile water. *Australian Journal of Hospital Pharmacy*. 27(5).

23. ENALAPRIL SUSPENSION 1MG/ML

Generic Name : Enalapril
Indication : i) Hypertension ii) Congestive heart failure
Dosage Form : Suspension
Strength : 1mg/ mL
Stability : 60 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Enalapril	20mg	5 tablets
Vehicle	qs	100mL

VEHICLE OF CHOICE:

- X-Temp® Oral Suspension System

PROCEDURE:

1. Crush tablets in mortar to make fine powders.
2. If needed, soak tablets in small amount of vehicle.
3. Add vehicle in small quantities until smooth paste is formed. Add more vehicle to the paste until liquid is formed.
4. Transfer the contents into a graduated cylinder.
5. Use additional vehicle to rinse the remaining drug from the mortar and add it into the graduate.
6. Make up to final volume with vehicle. Stir well.
7. Transfer suspension to final container and label.

NOTES:

1. Keep in an amber bottle.

REFERENCES:

1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

24. FERRIC AMMONIUM CITRATE 400MG/5ML MIXTURE

Generic Name : Ferric Ammonium Citrate
Indication : Prevention and treatment of iron deficiency anaemia
Dosage Form : Mixture
Strength : 400mg/5ml
Stability : 3 months
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Ferric Ammonium Citrate	-	80g
Chloroform Water Double-Strength BP	-	500ml
Lemon Spirit	-	2ml
Syrup BP/Syrup Simplex	-	100ml
Distilled water	qs	1000ml

PROCEDURE:

1. Prepare chloroform water double strength BP by mixing chloroform water BP with sterile water for (1:200) ratio.
2. Add Ferric Ammonium Citrate powder and stir.
3. Add simplex syrup and lemon lime essence. Stir well.
4. Add sufficient water to make up the final volume required.

NOTES:

REFERENCES:

1. Pharmaceutical Society of Great Britain (1973) *British pharmaceutical codex 1973*. England: Pharmaceutical Press.
2. Sweetman SC. (2014) Martindale: *The complete drug reference*. 38th Edition. Pharmaceutical Press.

25. FOLIC ACID SUSPENSION 1MG/ML

Generic Name : Folic Acid
Indication : Folate deficiency
Dosage Form : Suspension
Strength : 1mg/mL
Stability : 60 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Folic Acid	5mg	20 tablets
Vehicle	qs	100mL

VEHICLE OF CHOICE:

- X-Temp® Oral Suspension System

PROCEDURE:

1. Crush tablets in mortar to make fine powders.
2. Add vehicle in small quantities until smooth paste is formed. Add more vehicle to the paste until liquid is formed.
3. Transfer the contents into a graduated cylinder.
4. Use additional vehicle to rinse the remaining drug from the mortar and add it into the graduate.
5. Make up to final volume with vehicle. Stir well.
6. Transfer suspension to final container and label.

NOTES:

REFERENCES:

1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

26. GABAPENTIN SUSPENSION 100MG/ML

Generic Name : Gabapentin
Indication : Epilepsy, Neuropathic pain
Dosage Form : Suspension
Strength : 100mg/mL
Stability : 28 days
Storage : Room temperature

INGREDIENTS	STRENGTH	QUANTITY
Gabapentin	300mg	20 capsules
Vehicle	qs	60mL

VEHICLE OF CHOICE:
- X-Temp® Oral Suspension System

PROCEDURE:
1. Carefully empty the capsules content into a mortar.
2. Add vehicle in small quantities until smooth paste is formed. Add more vehicle to the paste until liquid is formed.
3. Transfer the contents into a graduated cylinder.
4. Use additional vehicle to rinse the remaining drug from the mortar and add it into the graduate.
5. Make up to final volume with vehicle. Stir well.
6. Transfer suspension to final container and label.

NOTES:

REFERENCES:
1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

27. GLYCOPYRROLATE SYRUP 0.1MG/ML

Generic Name : Glycopyrrolate
Indication : To reduce excessive drooling
Dosage Form : Syrup
Strength : 0.1mg/mL
Stability : 14 days
Storage : Refrigerate (preferable) or at room temperature and protect from light.

INGREDIENTS	STRENGTH	QUANTITY
Glycopyrrolate injection	200mcg/mL	5mL
Simple Syrup	qs	10mL

PROCEDURE:

1. Break the ampoule and syringe out the content of glycopyrrolate from the ampoule with 5 µm filter into a mortar.
2. Add the sufficient quantity of simple syrup and stir well.
3. Use additional simple syrup to rinse the remaining drug from the mortar and pour into the container.
4. Make up to final volume with simple syrup.
5. Shake well and label.

NOTES:

1. Keep in an amber plastic bottle.

REFERENCES:

1. Taketomo CK, Hodding JH, Kraus DM. *Pediatric Dosage Handbook 1996-1997*. United State:Lexi-Comp.
2. Christine L, Jean-Marc F & Patrice H.(2005) Stability and subjective taste acceptability of four glycopyrrolate solutions for oral administration. *Int J of Pharmaceutical Compounding*. 9(5):396.

28. HYDROCHOLOROTHIAZIDE SUSPENSION 5MG/ML

Generic Name : Hydrochlorothiazide
Indication : Diuretic, hypertension
Dosage Form : Suspension
Strength : 5mg/mL
Stability : 60 days
Storage : Refrigerate or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Hydrochlorothiazide	25mg	20 tablets
Vehicle	qs	100 mL

VEHICLE OF CHOICE:
- X-Temp® Oral Suspension System

PROCEDURE:
1. Crush tablets in mortar to make fine powders.
2. If needed, soak tablets in a small amount of vehicle.
3. Add vehicle in small quantities until smooth paste is formed. Add more vehicle to the paste until liquid is formed.
4. Transfer the contents into a graduated cylinder.
5. Use additional vehicle to rinse the remaining drug from the mortar and add it into the graduate.
6. Make up to final volume with vehicle. Stir well.
7. Transfer suspension to a container and label.

NOTES:

REFERENCES:
1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

29. INDOMETHACIN SYRUP 5MG/ML

Generic Name : Indomethacin
Indication : Pain and inflammation in rheumatic disease
Dosage Form : Syrup
Strength : 5mg/mL
Stability : 60 days
Storage : Refrigerate and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Indomethacin	25mg	20 capsules
Simple syrup	qs	100mL

PROCEDURE:

1. Open capsules and empty the contents into a mortar.
2. Levigate the powder with small amount of simple syrup until smooth paste is formed.
3. Add more simple syrup to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional simple syrup to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with simple syrup.
6. Shake well and label.

NOTES:

1. Keep in an amber bottle.

REFERENCES:

1. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.
2. Canadian Society of Hospital Pharmacy (1988) Extemporaneous Oral Liquid Dosage Form Preparations. *Pharmacy Practice*. 14(2).p.63.

30. ISONIAZID SYRUP 10MG/ML

Generic Name : Isoniazid
Indication : i) Tuberculosis ii) Tuberculous meningitis
Dosage Form : Syrup
Strength : 10mg/mL
Stability : 21 days
Storage : Refrigerate

INGREDIENTS	STRENGTH	QUANTITY
Isoniazid	100mg	10 tablets
Distilled water	-	10mL
Sorbitol 70% Solution	qs	100mL

PROCEDURE:

1. Crush tablets in a mortar to a fine powder.
2. Levigate the powder with 10mL of distilled water until a smooth paste is formed.
3. Add Sorbitol 70% to the paste until a liquid is formed and transfer the liquid into the container.
4. Use additional Sorbitol 70% to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with Sorbitol 70%.
6. Shake well and label.

NOTES:

1. Do not use sugar based syrups.

REFERENCES:

1. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

31. LABETALOL SYRUP 10MG/ML

Generic Name : Labetalol
Indication : Hypertension
Dosage Form : Syrup
Strength : 10mg/mL
Stability : 28 days
Storage : Refrigerate (preferable) or at room temperature

INGREDIENTS	STRENGTH	QUANTITY
Labetalol	100mg	12 tablets
Simple syrup	qs	120mL

PROCEDURE:

1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of Simple syrup until smooth paste is formed.
3. Add more Simple syrup to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

REFERENCES:

1. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

32. LABETALOL SYRUP 40MG/ML

Generic Name : Labetalol
Indication : Hypertension
Dosage Form : Syrup
Strength : 40mg/mL
Stability : 60 days
Storage : Refrigerate (preferable) or at room temperature and protect from light.

INGREDIENTS	STRENGTH	QUANTITY
Labetalol	100mg	48 tablets
Vehicle	qs	120mL

VEHICLE OF CHOICE:

- Ora-Sweet® : Ora-Plus®(1:1) or
- Ora-Blend ® or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:

1. Crush tablets in a mortar to a fine powder.
2. Levigate the powder with small amount of vehicle until a smooth paste is formed.
3. Add more vehicle to the paste until a liquid is formed and transfer the liquid into the container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

1. Keep in an amber plastic (polyethylene terephthalate) bottle.

REFERENCES:

1. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.
2. Allen LV, Erickson MA (1996) Stability of labetalol hydrochloride, metoprolol tartrate, verapamil hydrochloride and spironolactone with hydrochlorothiazide in extemporaneously compounded oral liquids. *Am J Health Sys Pharm*. 53(2).2304-8.

33. LANSOPRAZOLE SUSPENSION 3MG/ML

Generic Name : Lansoprazole
Indication : i) Peptic ulcer disease
ii) Reflux oesophagitis
iii) Zollinger-Ellison Syndrome
iv) For eradication of Helicobacter pylori in combination with antibiotic
Dosage Form : Suspension
Strength : 3mg/mL
Stability : 14 days (refrigerated), 8 hours (room temperature)
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Lansoprazole	30mg	10 capsules
Sodium bicarbonate 8.4% injection	qs	100mL

PROCEDURE:

1. Open capsules and empty the contents into a mortar.
2. Syringe out sodium bicarbonate 8.4% injection solution from ampoule using 5µ filter.
3. Levigate the powder with small amount of sodium bicarbonate solution until smooth paste is formed.
4. Add more sodium bicarbonate solution to the paste until liquid is formed and transfer the liquid into a graduated container.
5. Use additional sodium bicarbonate solution to rinse the remaining drug from the mortar and pour into the container.
6. Make up to final volume with sodium bicarbonate solution.
7. Shake well and label.

NOTES:

1. Keep in an amber plastic bottle or oral syringes.

REFERENCES:

1. Pharmacy Compounding Manual 2011, Alberta Health Services.

34. LORAZEPAM SYRUP 0.4MG/ML

Generic Name : Lorazepam
Indication : i) Severe anxiety ii) Insomnia
Dosage Form : Syrup
Strength : 0.4mg/mL
Stability : 30 days
Storage : Refrigerate

INGREDIENTS	STRENGTH	QUANTITY
Lorazepam	2mg	15 tablets
Simple syrup	qs	75mL

PROCEDURE:

1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of simple syrup until smooth paste is formed.
3. Add more simple syrup to the paste until liquid is formed and transfer the liquid into a graduated container.
4. Use additional simple syrup to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with simple syrup.
6. Shake well and label.

NOTES:

REFERENCES:

1. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

35. METHYLCELLULOSE SUSPENDING AGENT 1% (0.01G/ML)

Generic Name : Methylcellulose
Dosage Form : Suspending Agent
Strength : 1% (0.01g/mL)
Stability : 6 months
Storage : Room temperature

INGREDIENTS	STRENGTH	QUANTITY
Methylcellulose Powder	CPS 1500	10g
Sodium Benzoate Powder	-	2g
Simple syrup	qs	1,000mL

PROCEDURE:

1. Dissolve Sodium Benzoate in 200mL of boiling distilled water.
2. Add Methylcellulose powder and stir well for 2-3 minutes (use blender if available). Make sure mixture is sufficiently heated so powders are completely dissolved.
3. Add 800mL ice cold water (carefully but quickly) and stir or blend well for 10 minutes.
4. Transfer to a 1 litre bottle.
5. Place on side and refrigerate overnight (minimum 4 hours) until liquid converts to gel.

NOTES:

1. Mixture is initially cloudy, becoming crystal clear with adequate cooling/ refrigeration and time.
2. Discard 30 days after opening.

REFERENCES:

1. Canadian Society of Hospital Pharmacy (1988) Extemporaneous Oral Liquid Dosage Form Preparations. *Pharmacy Practice*.14(2).p.63.
2. Pharmacy Compounding Manual 2011, Alberta Health Services.

36. METOPROLOL SUSPENSION 10MG/ML

Generic Name : Metoprolol
Indication : Hypertension, angina, myocardial infarction, arrhythmias
Dosage Form : Suspension
Strength : 10mg/mL
Stability : 60 days
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Metoprolol	100mg	12 tablets
Vehicle	qs	120mL

VEHICLE OF CHOICE:

- Ora-Sweet® : Ora-Plus® (1:1) or
- Ora-Sweet SF® : Ora-Plus® (1:1) or
- Ora-Blend ® or
- Ora-Blend SF® or
- Cherry syrup or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:

1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

1. Keep in an amber plastic bottle.
2. Ora-Sweet® SF and Ora-Blend SF® should not be used in neonates ≤28 days corrected age.

REFERENCES:

1. Nahata MC, Pai VB, Hipple TF. (2011) *Pediatric Drug Formulation*. 6th Edition. Harvey Whitney Books.
2. Pharmacy Compounding Manual 2011, Alberta Health Services.
3. American Journal of Health-Systems Pharmacy, 1996, 53(19): p 2304-9.

37. MIDAZOLAM SYRUP 2MG/ML

Generic Name : Midazolam
Indication : Pre-operative sedation, induction of general anaesthesia, premedication and sedation in ICU and sedation for minor procedures
Dosage Form : Syrup
Strength : 2mg/mL
Stability : 56 days
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Midazolam injection	5mg/mL	48mL
Simple Syrup	qs	120mL

PROCEDURE:

1. Break the ampoule and syringe out the content of Midazolam from the ampoule with 5 µm filter into a mortar.
2. Add the sufficient quantity of simple syrup and stir well.
3. Use additional simple syrup to rinse the remaining drug from the mortar and pour into the container.
4. Make up to final volume with simple syrup.
5. Shake well and label.

NOTES:

1. Undiluted injection can be administered orally.
2. Injection may contain benzyl alcohol.
3. Keep in an amber glass bottle.

REFERENCES:

1. Pharmacy Compounding Manual 2011, Alberta Health Services.
2. Nahata MC, Pai VB, Hipple TF. (2011) Pediatric Drug Formulation.6th Edition. Harvey Whitney Books.

38. NIFEDIPINE SUSPENSION 1MG/ML

Generic Name : Nifedipine
Indication : Hypertension
Dosage Form : Suspension
Strength : 1mg/mL
Stability : 28 days
Storage : Refrigerate (preferable) or at room temperature

INGREDIENTS	STRENGTH	QUANTITY
Nifedipine	10mg	5 tablets
Methylcellulose 1%	qs	50mL

PROCEDURE:

1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of Methylcellulose 1% until smooth paste is formed.
3. Add more Methylcellulose 1% to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional Methylcellulose 1% to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with Methylcellulose 1%.
6. Shake well and label.

NOTES:

REFERENCES:

1. Nahata MC, Pai VB, Hipple TF. (2011) *Pediatric Drug Formulation*. 6th Edition. Harvey Whitney Books.
2. Minna HT. (2013) *Compounding of paediatric oral formulations: Extemporaneous nifedifine capsules, powders and suspensions in the hospital pharmacy*. University of Eastern Finland.

39. NIFEDIPINE SUSPENSION 4MG/ML

Generic Name : Nifedipine
Indication : Hypertension
Dosage Form : Suspension
Strength : 4mg/mL
Stability : 90 days
Storage : Refrigerate (preferable) or at room temperature

INGREDIENTS	STRENGTH	QUANTITY
Nifedipine	10mg	12 tablets
Vehicle	qs	30mL

VEHICLE CHOICE:
- Ora-Sweet® : Ora-Plus® (1:1) or
- Ora-Blend ® or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Keep in an amber bottle.

REFERENCES:
1. Nahata MC, Morosco R, Willhite E. (2002) Stability of nifedipine in two oral suspensions stored at two temperatures. *J Am Pharm Assoc*. (42):865-867.
2. Nationwide Children's. Compounding Formulas. [Online] Available from: http://www.nationwidechildrens.org/outpatient-pharmacy-compounding-formulas. [Accessed:9th Oct 2015]
3. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

40. NITROFURANTOIN SUSPENSION 10MG/ML

Generic Name : Nitrofurantoin
Indication : Uncomplicated lower urinary tract infections
Dosage Form : Suspension
Strength : 10mg/mL
Stability : 91 days
Storage : Refrigerate or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Nitrofurantoin	100mg	10 tablets
Vehicle	qs	100mL

VEHICLE CHOICE:
- Ora-Sweet® : Ora-Plus® (1:1) or
- Ora-Blend ® or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Crush tablets in a mortar to a fine powder.
2. Levigate the powder with small amount of vehicle until a smooth paste is formed.
3. Add more vehicle to the paste until a liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Keep in an amber bottle. Do not freeze.
2. If use X-Temp® Oral Suspension System, the stability of the product is 60 days.

REFERENCES:
1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.
2. Ensom MHH, Decarie D.(2006) Stability of nitrofurantoin in extemporaneously compounded suspensions. *Can J Hosp Pharm* (59).p. 29-33.
3. Pharmacy Compounding Manual 2011, Alberta Health Services.

41. OMEPRAZOLE SUSPENSION 2MG/ML

Generic Name : Omeprazole
Indication : i) Reflux oesophagitis, eradication of H. Pylori infection, benign peptic ulcer not responding to conventional therapy, Zollinger-Ellison Syndrome
ii) Endoscopically confirmed peptic ulcer
Dosage Form : Suspension
Strength : 2mg/mL
Stability : 14 days (room temperature) or 30 days (refrigerate)
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Omeprazole (capsules or tablets)	20mg	10 capsules
Sodium Bicarbonate Injection	8.4%	10 amp x 10mL

PROCEDURE:

Capsules

1. Empty contents of capsules in a mortar and cover with sodium bicarbonate and stir the mixture.
2. Add more sodium bicarbonate to form liquid and then transfer to a graduated container.
3. Rinse the mortar with additional sodium bicarbonate and make up to the final volume required.

Tablets

1. Place tablets in mortar and soak in sodium bicarbonate for 20 minutes.
2. Crush tablets to form slurry and stir the mixture well.
3. Add more sodium bicarbonate to form liquid and then transfer to a graduated container.
4. Rinse mortar with additional sodium bicarbonate and make up to the final volume required.

NOTES:

1. Keep in an amber glass bottle.
2. Colour changes of the preparation might occur.

REFERENCES:

1. Quercia RA, Chengde F, Xinchun Liu, et al. (1997) Stability of omeprazole in an extemporaneously prepared oral liquid. Am J Health-Syst Pharm. (54): 1833-6.
2. Nahata MC, Pai VB, Hipple TF. (2011) Pediatric Drug Formulation. 6th Edition. Harvey Whitney Books.
3. Pharmacy Compounding Manual 2011, Alberta Health Services.

42. PANTOPRAZOLE 2MG/ML

Generic Name : Pantoprazole
Indication : i) Reflux oesophagitis, eradication of H. Pylori infection, benign peptic ulcer not responding to conventional therapy, Zollinger-Ellison Syndrome
ii) Endoscopically confirmed peptic ulcer
Dosage Form : Solution
Strength : 2mg/mL
Stability : 62 days
Storage : Refrigerate

INGREDIENTS	STRENGTH	QUANTITY
Pantoprazole sodium	20mg	10 tablets
Sodium bicarbonate	Powder	8.4g
Distilled water	qs	100mL

PROCEDURE:

1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of distilled water until smooth paste is formed.
3. Add more distilled water to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional distilled water to rinse the remaining drug from the mortar and pour into the container. While stirring, add sodium bicarbonate powder. Stir until tablets disintegrate.
5. Make up to final volume with distilled water.

NOTES:

REFERENCES:

1. Pharmacy Compounding Manual 2011, Alberta Health Services.

43. PENTOXIFYLLINE SOLUTION 20MG/ML

Generic Name : Pentoxifylline
Indication : Peripheral vascular disease
Dosage Form : Solution
Strength : 20mg/mL
Stability : 91 days
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Pentoxifylline Tablets	400mg	12 tablets
Distilled Water	qs	240mL

PROCEDURE:

1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of distilled water until smooth paste is formed.
3. Add more distilled water to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional distilled water to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with distilled water.
6. Shake well and label.

NOTES:

1. Keep in an amber glass bottle.

REFERENCES:

1. Pharmacy Compounding Manual 2011, Alberta Health Services.
2. Nahata MC, Pai VB, Hipple TF. (2011) *Pediatric Drug Formulation*. 6th Edition. Harvey Whitney Books.
3. Abdel-Rahman S, Nahata MC. (1997) Stability of pentoxifylline in an extemporaneously prepared oral suspension. *Am J Health Syst Pharm*. 54(11):1301-3.

44. PHENOBARBITONE SUSPENSION 10MG/ML

Generic Name : Phenobarbitone
Indication : Epilepsy
Dosage Form : Suspension
Strength : 10mg/mL
Stability : 115 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Phenobarbitone	30mg	20 tablets
Vehicle	qs	60mL

VEHICLE CHOICE:
- Ora-Sweet® : Ora-Plus® (1:1) or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Keep in an amber plastic bottle.

REFERENCES:
1. Cober MP, Johnson CE. (2007) Stability of an extemporaneously prepared alcohol-free phenobarbital suspension. *Am J Health Syst Pharm*. 64(6):644-646.
2. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.
3. Paddock Laboratories. Stability of extemporaneously prepared oral liquid formulations – part vi. Secundum Artem (Vol 15)No 1.

45. PHYTOMENADIONE (VITAMIN K1) LIQUID 1MG/ML

Generic Name : Phytomenadione (Vitamin K1)
Indication : Vitamin K deficiency due to liver failure
Dosage Form : Liquid
Strength : 1mg/mL
Stability : Sterile water (preferred): 104 days
Simple Syrup: 111 days
Storage : Refrigerate or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Phytomenadione Injection	10mg	1mL
Sterile Water or Simple Syrup	qs	10mL

PROCEDURE:

1. Using a 5µm filter, withdraw the required amount of Vitamin K1 and transfer into an amber glass bottle.
2. Add vehicle and mix well.

NOTES:

1. Keep in an amber glass bottle.
2. Sterile water formulation is preferred in neonates due to absence of dyes and lower osmolarity.
3. This preparation contains benzyl alcohol, special precaution for children less than 2 years old.

REFERENCES:

1. Pharmacy Compounding Manual 2011, Alberta Health Services.

46. PROPRANOLOL SUSPENSION 0.5MG/ML

Generic Name : Propranolol
Indication : Dysrhythmias, tachycardia, hypertrophic obstructive cardiomyopathy (For cardiologist only)
Dosage Form : Suspension
Strength : 0.5mg/mL
Stability : 30 days
Storage : Room temperature

INGREDIENTS	STRENGTH	QUANTITY
Propranolol	40mg	3 tablets
Simple Syrup	qs	240mL

PROCEDURE:

1. Crush tablets in a mortar to a fine powder.
2. Levigate the powder with distilled water until smooth.
3. Add a small amount of simple syrup to form a smooth paste. Add more syrup until a liquid is formed and transfer the contents into a graduate cylinder. Use additional simple syrup to rinse the remaining drug from the mortar.
4. To make up final volume with simple syrup.
5. Transfer the suspension into the amber bottle.
6. Shake well and label.

NOTES:

1. Due to the lack of microbial testing and evaluation of stabilty under in use conditions, a maximum expiry date of 30 days is recommended for these formulations.

REFERENCES:

1. PharmInfoTech: Database of Oral Liquid Formulations-eMixt. [Online] Available from: http://www.pharminfotech.co.nz/manual/Formulation/mixtures/propranolol.html [Accessed:15th Oct 2015].

47. PROPRANOLOL SUSPENSION 1MG/ML

Generic Name : Propranolol
Indication : Dysrhythmias, tachycardia, hypertrophic obstructive cardiomyopathy (For cardiologist only)
Dosage Form : Suspension
Strength : 1mg/mL
Stability : 45 days
Storage : Refrigerate and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Propranolol	40mg	6 tablets
Distilled Water (wetting agent)	-	4.8mL
Citric Acid Solution	25%	1mL
Simple Syrup	qs	240mL

PROCEDURE:

1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with distilled water until smooth.
3. Add a small amount of simple syrup to form smooth paste. Add more syrup until liquid is formed and transfer the contents into a graduated cylinder. Use additional simple syrup to rinse the remaining drug from the mortar.
4. Add citric acid to the suspension in the graduate. Mix well.
5. Make up to final volume with simple syrup.
6. Transfer the suspension into an amber bottle.
7. Shake well and label.

NOTE:

1. Keep in an amber glass bottle.
2. Citric acid is used only for pH adjustment. No need to decrease expiry to citric acid's expiry.

REFERENCES:

1. Pharmacy Compounding Manual 2011, Alberta Health Services.
2. Sick Kids® Pharmacy. (2007) Compounding Service.[Online] Available from: http://www.sickkids.ca/Pharmacy/Compounding-Service/index.html [Accessed:15th Oct 2015].
3. Nahata MC, Pai VB, Hipple TF. (2011) *Pediatric Drug Formulation*. 6th Edition. Harvey Whitney Books.

48. PYRAZINAMIDE SUSPENSION 10MG/ML

Generic Name : Pyrazinamide
Indication : Tuberculosis
Dosage Form : Suspension
Strength : 10mg/mL
Stability : 60 days
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Pyrazinamide	500mg	3 tablets
Vehicle	qs	150mL

VEHICLE CHOICE:
- Ora-Sweet® : Ora-Plus® (1:1) or
- Ora-Sweet SF®: Ora-Plus® (1:1) or
- Ora-Blend SF® or
- Cherry syrup or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Crush tablets in a mortar to fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Ora-Sweet SF® and Ora-Blend SF® should not be used in neonates ≤28 days corrected age.
2. Keep in an amber bottle.

REFERENCES:
1. Allen LV Jr, Erickson M A.(1998) Stability of bethanechol chloride, pyrazinamide, quinidine sulfate, rifampin, and tetracycline hydrochloride in extemporaneously compounded oral liquids. *Am J Health Syst Pharm*. 55(17):1804-1809.

49. PYRAZINAMIDE SYRUP 100MG/ML

Generic Name : Pyrazinamide
Indication : Tuberculosis
Dosage Form : Syrup
Strength : 100mg/mL
Stability : 60 days
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Pyrazinamide	500mg	200 tablets
Simple Syrup	qs	1,000mL

PROCEDURE:

1. Crush tablets in a mortar to form a fine paste.
2. Levigate the powder with small amount of simple syrup until a smooth paste is formed.
3. Add more simple syrup to the paste until a liquid is formed and transfer the liquid into the container.
4. Use additional simple syrup to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with simple syrup.
6. Shake well and label.

NOTES:

1. Keep in an amber bottle.

REFERENCES:

1. Nahata MC, Morosco RS, Peritore SP. (1995) Stability of pyrazinamide in two suspensions. *Am J Health Syst Pharm*. 52(14): 1558-1560.
2. Pharmacy Compounding Manual 2011, Alberta Health Services.
3. Nationwide Children's. Compounding Formulas. [Online] Available from: http://www.nationwidechildrens.org/outpatient-pharmacy-compounding-formulas. [Accessed:9th Oct 2015]

50. RIFAMPICIN SYRUP 10MG/ML

Generic Name : Rifampicin
Indication : Tuberculosis
Dosage Form : Syrup
Strength : 10mg/mL
Stability : 28 days
Storage : Refrigerate and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Rifampicin	300mg	4 capsules
Simple Syrup	qs	120mL

PROCEDURE:

1. Open capsules and empty the contents into a mortar.
2. Levigate the powder with small amount of simple syrup until smooth paste is formed.
3. Add more simple syrup to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional simple syrup to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with simple syrup.
6. Shake well and label.

NOTES:

1. Keep in an amber bottle.

REFERENCES:

1. Pharmacy Compounding Manual 2011, Alberta Health Services.

51. RIFAMPICIN SUSPENSION 25MG/ML

Generic Name : Rifampicin
Indication : Tuberculosis
Dosage Form : Suspension
Strength : 25mg/mL
Stability : 28 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Rifampicin	300mg	10 capsules
Vehicle	qs	120mL

VEHICLE CHOICE:
- Ora-Sweet® : Ora-Plus® (1:1) or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Open capsules and empty the contents into a mortar.
2. Levigate the powder with small amount of vehicle until a smooth paste is formed.
3. Add more vehicle to the paste until a liquid is formed and transfer the liquid into the container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

REFERENCES:
1. Pharmacy Compounding Manual 2011, Alberta Health Services.

52. SILDENAFIL SUSPENSION 2.5MG/ML

Generic Name : Sildenafil
Indication : Pulmonary hypertension
Dosage Form : Suspension
Strength : 2.5mg/mL
Stability : 91 days
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Sildenafil	20mg	5 tablets
Vehicle	qs	40mL

VEHICLE CHOICE:
- Ora-Sweet® : Ora-Plus® (1:1) or
- Methylcellulose 1%: Simple Syrup (1:1) or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Crush tablets in a mortar to form a fine paste.
2. Levigate the powder with small amount of vehicle until a smooth paste is formed.
3. Add more vehicle to the paste until a liquid is formed and transfer the liquid into the container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Keep in an amber bottle.

REFERENCES:
1. Pharmacy Compounding Manual 2011, Alberta Health Services.
2. Nahata MC., Morosco RS, Brady MT. (2006) extemporaneous sildenafil citrate oral suspensions for the treatment of pulmonary hypertension in children. *Am J Health Syst Pharm*. 63(3): 254-257.

53. SPIRONOLACTONE SYRUP 1.25MG/ML

Generic Name : Spironolactone
Indication : Oedema and ascites in cirrhosis of the liver, congestive heart failure
Dosage Form : Syrup
Strength : 1.25mg/mL
Stability : 60 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Spironolactone	25mg	5 tablets
Vehicle	qs	100mL

VEHICLE CHOICE:
- X-Temp® Oral Suspension System.

PROCEDURE:
1. Crush tablets in a mortar to form fine paste.
2. Levigate the powder with sterile water for injection until smooth paste is formed.
3. Add simple syrup to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional simple syrup to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Keep in an amber bottle.

REFERENCES:
1. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

54. SPIRONOLACTONE SYRUP 2.5MG/ML

Generic Name : Spironolactone
Indication : Oedema and ascites in cirrhosis of the liver, congestive heart failure.
Dosage Form : Syrup
Strength : 2.5mg/mL
Stability : 60 days
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Spironolactone	25mg	4 tablets
Sterile water for injection	-	5mL
Simple Syrup	qs	40mL

PROCEDURE:

1. Crush tablets in a mortar to form fine paste.
2. Levigate the powder with sterile water for injection until smooth paste is formed.
3. Add simple syrup to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional simple syrup to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with simple syrup.
6. Shake well and label.

NOTES:

1. Keep in an amber bottle.

REFERENCES:

1. Salgado AC, Rosa ML, Duarte MA et al. (2005) Stability of Spironolactone in an extemporaneously prepared aqueous suspension: the importance of microbiological quality of compounded paediatric formulations. *Eur J Hosp Pharm Science*. 11(3):68-73.

55. TRIMETHOPRIM SUSPENSION 10MG/ML

Generic Name : Trimethoprim
Indication : Treatment of urinary tract infections due to susceptible pathogens
Dosage Form : Suspension
Strength : 10mg/mL
Stability : 6 weeks at 25°C, 3 months at 4°C
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Trimethoprim	100mg	10 tablets
Methylcellulose 1%: Simple Syrup (1:1)	qs	100mL

PROCEDURE:

1. Prepare 100mL of a mixture of equal parts methylcellulose 1% and syrup.
2. Crush the trimethoprim tablets and then slowly add the base whilst mixing.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

1. A suspending base of methylcellulose 1-2% without syrup can be used if preferred.
2. Keep in an amber plastic bottle.

REFERENCES:

1. PharmInfoTech: Database of Oral Liquid Formulations-eMixt. [Online] Available from: http://www.pharminfotech.co.nz/manual/Formulation/mixtures/trimethoprim.html. [Accessed: 15th Oct 2015].
2. Nahata MC.(1997)Stability of trimethoprim in an extemporaneous liquid dosage form. *J Ped Pharm Pract*. 2(2):82-4.

56. TRIMETHOPRIM SYRUP 10MG/ML

Generic Name : Trimethoprim
Indication : Treatment of urinary tract infections due to susceptible pathogens
Dosage Form : Syrup
Strength : 10mg/mL
Stability : 30 days
Storage : Room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Trimethoprim	100mg	10 tablets
Simple Syrup	qs	100mL

PROCEDURE:

1. Soak the tablets in mortar with some simple syrup for about 10 minutes.
2. Levigate with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a graduated container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

1. Keep in an amber bottle.

REFERENCES:

1. Sick Kids® Pharmacy. (2007) Compounding Service.[Online] Available from: http://www.sickkids.ca/Pharmacy/Compounding-Service/index.html [Accessed: 15th Oct 2015].
2. Pharmacy Compounding Manual 2011, Alberta Health Services.

57. URSODEOXYCHOLIC ACID SUSPENSION 50MG/ML

Generic Name : Ursodeoxycholic Acid
Indication : Cholestatic liver diseases (eg. primary biliary cirrhosis, primary cholangitis etc)
Dosage Form : Suspension
Strength : 50mg/mL
Stability : 30 days
Storage : Refrigerate or at room temperature

INGREDIENTS	STRENGTH	QUANTITY
Ursodeoxycholic Acid	300mg	20 capsules
Vehicle	qs	120mL

VEHICLE OF CHOICE:
- Ora-Blend® or Ora-Blend SF® or
- Ora-Plus® : Ora-Sweet® (1:1) or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)
- X-Temp® Oral Suspension System (stability is for 90 days)

PROCEDURE:
1. If Ora-Blend or X-Temp® is unavailable, pre-mix the Ora-Plus and Ora-Sweet, to form the diluent.
2. Open capsules and empty the contents into a mortar and add the diluent.
3. Levigate the powder until smooth paste is formed.
4. Add vehicle to the paste until liquid is formed and transfer the liquid into a container.
5. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
6. Make up to final volume with vehicle.
7. Shake well and label.

NOTES:
1. Ora-Blend SF® should not be used in neonates ≤28 days corrected age.

REFERENCES:
1. Sick Kids® Pharmacy. (2007) Compounding Service.[Online] Available from: http://www.sickkids.ca/Pharmacy/Compounding-Service/index.html [Accessed:15th Oct 2015].
2. PharmInfoTech: Database of Oral Liquid Formulations-eMixt. [Online] Available from: http://www.pharminfotech.co.nz/manual/Formulation/bsheets/ursodeoxycholicNZS_1.pdf [Accessed: 15th Oct 2015].
3. X-Temp® Oral Suspension System. Master Formulation Sheets 2013.

58. VERAPAMIL SUSPENSION 50MG/ML

Generic Name : Verapamil
Indication : i) Supraventricular tachyarrhythmia (SVT) prophylaxis
ii) Angina
Dosage Form : Suspension
Strength : 50mg/mL
Stability : 60 days
Storage : Refrigerate (preferable) or at room temperature and protect from light

INGREDIENTS	STRENGTH	QUANTITY
Verapamil hydrochloride	40mg	150 tablets
Vehicle	qs	120mL

VEHICLE CHOICE:
- Ora-Sweet® : Ora-Plus® (1:1) or
- Ora-Sweet SF® : Ora-Plus® (1:1) or
- Equivalent vehicle to Ora-Sweet® : Ora-Plus® (1:1)

PROCEDURE:
1. Crush tablets in a mortar to a fine powder.
2. Levigate the powder with small amount of vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:
1. Ora-Sweet SF® should not be used in neonates ≤28 days corrected age.
2. Keep in an amber bottle.

REFERENCES:
1. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

59. VERAPAMIL SUSPENSION 8MG/ML

Generic Name : Verapamil
Indication : i) Supraventricular tachyarrhythmia (SVT) prophylaxis
ii) angina
Dosage Form : Suspension
Strength : 8mg/mL
Stability : 30 days
Storage : Room temperature

INGREDIENTS	STRENGTH	QUANTITY
Verapamil hydrochloride	40mg	10 tablets
Distilled water	-	1mL
Simple syrup	qs	50mL

PROCEDURE:

1. Soak tablets in a small amount of distilled water and then crush tablets in a mortar to fine powder.
2. Levigate the powder with vehicle until smooth paste is formed.
3. Add more vehicle to the paste until liquid is formed and transfer the liquid into a graduated container.
4. Use additional vehicle to rinse the remaining drug from the mortar and pour into the container.
5. Make up to final volume with vehicle.
6. Shake well and label.

NOTES:

1. Flavouring may be added.

REFERENCES:

1. Pharmacy Compounding Manual 2008, Calgary Health Region Pharmacy.

ABBREVIATIONS:

mg - milligram
mL - millilitre
qs - up to

NOTES:

PHARMACEUTICAL SERVICES DIVISION
MINISTRY OF HEALTH MALAYSIA

Published by:
Pharmaceutical Services Division
MINISTRY OF HEALTH MALAYSIA

For more information:
Please visit **www.pharmacy.gov.my**
or contact **National Pharmacy Call Center**
toll-free number at **1800-88-6722**

ISBN 978-967-5570-65-0