



Suggested Formula	Bupivacaine Hydrochloride 0.25%, Epinephrine 1:200 000 Injection (Solution, 50 mL)	FIN	F 008 657v2
-------------------	--	-----	-------------

SUGGESTED FORMULATION

Ingredient Listing	Qty.	Unit	NDC #	Supplier	Lot Number	Expiry Date
Bupivacaine Hydrochloride, USP	TBD					
Epinephrine 0.1% Stock Solution †	0.25	mL				
Sodium Chloride, USP	0.385	g				
Benzyl Alcohol (Parenteral Application), NF	0.25	mL				
Sterile Water for Irrigation, USP	40.0	mL				
Sterile Water for Irrigation, USP	q.s. to 50.0	mL				
Hydrochloric Acid 10% Solution	As required					
† Epinephrine 0.1% Stock Solution						
Epinephrine, USP	0.100	g				
Sterile Water for Injection, USP	90.0	mL				
Sterile Water for Injection, USP	q.s. to 100.0	mL				
Hydrochloric Acid 10% Solution	As required					

SPECIAL PREPARATORY CONSIDERATIONS

<u>Ingredient-Specific Information</u>	
Light Sensitive (protect from light whenever possible):	Epinephrine, Benzyl Alcohol, Bupivacaine Hydrochloride
Air Sensitive (protect from air whenever possible):	Epinephrine



Suggested Formula	Bupivacaine Hydrochloride 0.25%, Epinephrine 1:200 000 Injection (Solution, 50 mL)	FIN	F 008 657v2
-------------------	--	-----	-------------

SPECIAL PREPARATORY CONSIDERATIONS (CONTINUED)

Suggested Preparatory Guidelines

Non-Sterile Preparation Sterile Preparation

Processing Error / Testing Considerations: To account for processing error, pH testing, sterility and endotoxin testing considerations during preparation, it is suggested to measure an additional **10 to 12%** of the required quantities of ingredients.

Special Instruction: This formula may contain one or more Active Pharmaceutical Ingredients (APIs) that may be classified as hazardous, please refer & verify the current NIOSH list of Antineoplastic and Other Hazardous Drugs in Healthcare Settings. At this time, **General Chapter <800> Hazardous Drugs – Handling in Healthcare Settings** is informational and not compendially applicable unless otherwise specified by regulators and enforcement bodies. For information on the scope, intended applicability, and implementation context for USP General Chapter <800>, see: <https://www.usp.org/compounding/general-chapter-hazardous-drugs-handling-healthcare>.

This formula must be prepared within the appropriate facilities under adequate environmental conditions, following the necessary guidelines and procedures as stated within *USP 797* and *USP 800*, when handling hazardous drugs. Only trained and qualified personnel must prepare this formula.

All heat stable, reusable materials and equipment must be sterilized and depyrogenated by dry heat sterilization at 250°C for 2 hours prior to use.

Compounder needs to verify as per USP, if every batch of final product compounded using this procedure must be sterility and endotoxin tested before being dispensed.

All required personal protective equipment (sterile and hazardous if applicable), such as but not limited to, gowns, aprons, sleeves, gloves both inner and outer if applicable, shoe covers, hairnet, head cap, beard cover, eyewear, appropriate face mask, respirator and face shield, etc., where applicable must be worn at all times. In addition, proper personnel cleansing must be done before entering the buffer or clean area.

If applicable, follow all required procedures for hazardous drug handling including but not limited to procurement, transport, storage, preparation, dispensing, administration, clean up (spills) & disposal.

Filter integrity must be validated by performing a filter stress test. If the test demonstrates that the filter might be defective, the solution must be discarded and remade.

If you are a registered 503B facility, please refer to all relevant guidance documents including but not limited to the Code of Federal Regulations (CFR), Guidance for Industry (GFI) and Compliance Policy Guides (CPGs).

This procedure requires the use of very small quantities of ingredients. All calculations and preparation techniques must be verified before dispensing the final product.



Suggested Formula	Bupivacaine Hydrochloride 0.25%, Epinephrine 1:200 000 Injection (Solution, 50 mL)	FIN	F 008 657v2
-------------------	--	-----	-------------

SUGGESTED PREPARATION (for 50 mL)

Weigh and / or measure the following ingredients when appropriate:

Ingredient Listing	Qty.	Unit	Multiplication factor (*): ____	Processing Error	Qty. to measure
Bupivacaine Hydrochloride, USP §	TBD				
Epinephrine 0.1% Stock Solution † §	0.25	mL			
Sodium Chloride, USP §	0.385	g			
Benzyl Alcohol (Parenteral Application), NF §	0.25	mL			
Sterile Water for Irrigation, USP §	40.0	mL			
Sterile Water for Irrigation, USP §	q.s. to 50.0	mL			
Hydrochloric Acid 10% Solution §	As required				
† Epinephrine 0.1% Stock Solution					
Epinephrine, USP §	0.100	g	--	--	
Sterile Water for Injection, USP §	90.0	mL	--	--	
Sterile Water for Injection, USP §	q.s. to 100.0	mL	--	--	
Hydrochloric Acid 10% Solution	As required		--	--	

* Takes into account increased batch size conversions and density conversions, if required.

§ Weigh / measure just prior to use.



Suggested Formula	Bupivacaine Hydrochloride 0.25%, Epinephrine 1:200 000 Injection (Solution, 50 mL)	FIN	F 008 657v2
-------------------	--	-----	-------------

Preparatory Instruction

IMPORTANT: All preparatory procedures must be performed using proper Aseptic Technique

1. **Equipment sterilization:**

Following the manufacturer's specifications, sterilize and depyrogenate all heat stable, reusable materials and equipment, then return to ambient temperature.

2. **Ingredient quantification:**

A. Determine the potency of Bupivacaine Hydrochloride based on the certificate of analysis:

MINUS	100%
Water Content (from certificate of analysis)	_____ %
DIVIDED BY	100
EQUALS	
Quantity of water free Bupivacaine Hydrochloride, in decimal	_____
MULTIPLIED BY	
Assay on anhydrous basis result (from certificate of analysis)	_____ %
DIVIDED BY	100
EQUALS	
i. Potency of Bupivacaine Hydrochloride, in decimal	_____



Suggested Formula	Bupivacaine Hydrochloride 0.25%, Epinephrine 1:200 000 Injection (Solution, 50 mL)	FIN	F 008 657v2
-------------------	--	-----	-------------

3.	<p><u>Ingredient quantification:</u></p> <p>A. Determine the quantity (in g) of Bupivacaine Hydrochloride to make a Bupivacaine Hydrochloride 0.25% Injection, batch size (50.0 mL):</p> <table border="1"> <tr> <td>Quantity of Bupivacaine Hydrochloride required for 50.0 mL</td> <td>0.125 g</td> </tr> <tr> <td>DIVIDED BY</td> <td></td> </tr> <tr> <td>Potency of Bupivacaine Hydrochloride, in decimal (Step 2Ai)</td> <td>_____</td> </tr> <tr> <td>EQUALS</td> <td></td> </tr> <tr> <td>i. Quantity of Bupivacaine Hydrochloride needed for 50.0 mL</td> <td>_____ g</td> </tr> <tr> <td>MULTIPLIED BY</td> <td></td> </tr> <tr> <td>Processing error adjustments (10 to 12%)</td> <td>1.10 to 1.12</td> </tr> <tr> <td>EQUALS</td> <td></td> </tr> <tr> <td>ii. Quantity of Bupivacaine Hydrochloride needed <i>plus</i> processing error adjustments</td> <td>_____ g</td> </tr> </table>	Quantity of Bupivacaine Hydrochloride required for 50.0 mL	0.125 g	DIVIDED BY		Potency of Bupivacaine Hydrochloride, in decimal (Step 2Ai)	_____	EQUALS		i. Quantity of Bupivacaine Hydrochloride needed for 50.0 mL	_____ g	MULTIPLIED BY		Processing error adjustments (10 to 12%)	1.10 to 1.12	EQUALS		ii. Quantity of Bupivacaine Hydrochloride needed <i>plus</i> processing error adjustments	_____ g
Quantity of Bupivacaine Hydrochloride required for 50.0 mL	0.125 g																		
DIVIDED BY																			
Potency of Bupivacaine Hydrochloride, in decimal (Step 2Ai)	_____																		
EQUALS																			
i. Quantity of Bupivacaine Hydrochloride needed for 50.0 mL	_____ g																		
MULTIPLIED BY																			
Processing error adjustments (10 to 12%)	1.10 to 1.12																		
EQUALS																			
ii. Quantity of Bupivacaine Hydrochloride needed <i>plus</i> processing error adjustments	_____ g																		
4.	<p>† <u>Epinephrine 0.1% Stock Solution preparation:</u></p> <p>A. Incrementally add the Epinephrine (0.100 g) to the Sterile Water for Injection (90.0 mL).</p> <p><u>Specifications:</u> Continuously mix until all solid particles have completely dissolved. If necessary, add a few drops of Hydrochloric Acid 10% Solution to facilitate the dissolution.</p> <p><u>End result:</u> Homogeneous liquid-like solution.</p> <p>B. Add additional Sterile Water for Injection to the mixture (Step 4A) to fill to the required batch size (100.0 mL).</p> <p><u>Specifications:</u> Continuously mix.</p> <p><u>End result:</u> Homogeneous liquid-like solution.</p>																		



Suggested Formula	Bupivacaine Hydrochloride 0.25%, Epinephrine 1:200 000 Injection (Solution, 50 mL)	FIN	F 008 657v2
-------------------	--	-----	-------------

5.	<p><u>Medium integration:</u></p> <p>A. In the given order, sequentially add the following ingredients to the Sterile Water For Irrigation (40.0 mL plus processing error adjustments):</p> <ul style="list-style-type: none">-Epinephrine 0.1% Stock Solution (0.25 mL plus processing error adjustments)-Bupivacaine Hydrochloride (amount determined in Step 3Aii)-Sodium Chloride-Benzyl Alcohol (Parenteral Application) <p><u>Specifications:</u> Continuously mix until all solid particles have completely dissolved.</p> <p><u>End result:</u> Homogeneous liquid-like solution.</p> <p><u>Note:</u> Add the next ingredient, once the previous one has been completely added and dissolved.</p>
6.	<p><u>pH testing:</u></p> <p>A. Draw an appropriate amount of the mixture (Step 5A).</p> <p>B. Test the pH of the sample. It should lie between 4.5 and 5.0.</p> <p>C. <u>If the pH > 5.0, carefully add, in a dropwise fashion, the Hydrochloric Acid 10% Solution to the mixture:</u></p> <ol style="list-style-type: none">1. Draw and transfer 1 or 2 drops of the Hydrochloric Acid 10% Solution to the mixture.2. Stir for at least 5 minutes to evenly disperse the Hydrochloric Acid 10% Solution.3. Re-test the pH.4. Continue to add the Hydrochloric Acid 10% Solution until the pH of 4.5 to 5.0 is obtained. <p>IMPORTANT: Do not allow the pH to fall below 4.5.</p>
7.	<p><u>Filling to volume:</u></p> <p>A. Add additional Sterile Water for Irrigation to the above mixture to fill to the required batch size (50.0 mL <i>plus</i> processing error adjustments).</p> <p><u>Specifications:</u> Continuously mix until homogeneous.</p> <p><u>End result:</u> Homogeneous liquid-like solution.</p>
8.	<p><u>Filtering and transferring:</u></p> <p>Aseptically filter the solution through a 0.22-µm sterile filter into the recommended dispensing container (see Packaging requirements). Transfer the remainder into a separate dispensing container. This is to be used as the test sample for sterility and endotoxin testing.</p>



Suggested Formula	Bupivacaine Hydrochloride 0.25%, Epinephrine 1:200 000 Injection (Solution, 50 mL)	FIN	F 008 657v2
-------------------	--	-----	-------------

9.	<u>Filter integrity test:</u> Validate filter integrity by performing a filter stress test. If the test demonstrates that the filter might be defective, the solution must be discarded and remade.
10.	<u>Terminal Sterilization:</u> In relation to the chemical composition of the formulation, final packaging, etc., select and validate an end-stage sterilization method and follow the manufacturer's specifications.
11.	<u>Sterility and Endotoxin testing:</u> Validate the test sample for sterility and endotoxins, in accordance to current USP 797 regulatory guidelines.

SUGGESTED PRESENTATION

Estimated Beyond-Use Date	24 hours controlled room temperature, 3 days refrigerated, or 45 days frozen, as per USP 797. BUD based on successful endotoxin test result.	Packaging Requirements	Sterile, tightly closed, light-resistant unit-dose injection vials.
Auxiliary Labels	1 Use as directed. Do not exceed prescribed dose.	7	Do not take with alcohol, sleep aids, tranquilizers or other CNS depressants.
	2 Keep out of reach of children.	8	Do not use if discolored.
	3 Discard container after use.	9	Protect from light.
	4 Equilibrate to room temperature before use.	10	Discard in the presence of particulate matter.
	5 Keep at controlled room temperature, (20°C – 25°C), refrigerated (2°C – 8°C) or frozen (-25°C to -10°C).	11	Consult your health care practitioner if any prescription or over-the-counter medications are currently being used or are prescribed for future use.
	6 May impair mental and/or physical ability. Use care when operating a car or machinery.		
Pharmacist Instructions	Add any auxiliary labels specific to the API to the dispensing container as deemed necessary.		
Patient Instructions	Contact your pharmacist in the event of adverse reactions.		



Suggested Formula	Bupivacaine Hydrochloride 0.25%, Epinephrine 1:200 000 Injection (Solution, 50 mL)	FIN	F 008 657v2
-------------------	--	-----	-------------

REFERENCES

1.	Parenteral Preparations. In: Allen, LV, Jr. <i>The Art, Science, and Technology of Pharmaceutical Compounding Fifth Edition</i> . American Pharmacists Association; 2016: 399.
2.	Epinephrine. In: Sweetman SC, ed. <i>Martindale: The Complete Drug Reference, 36th Edition</i> . London, England: The Pharmaceutical Press; 2009: 1203.
3.	Bupivacaine Hydrochloride. In: Sweetman SC, ed. <i>Martindale: The Complete Drug Reference, 36th Edition</i> . London, England: The Pharmaceutical Press; 2009: 1854.
4.	Epinephrine (Monograph). In: O'Neil MJ. <i>The Merck Index 15th Edition</i> . Whitehouse Station, NJ: Merck & Co, Inc.; 2013: Monograph #3674.
5.	Bupivacaine (Monograph). In: O'Neil MJ. <i>The Merck Index 15th Edition</i> . Whitehouse Station, NJ: Merck & Co, Inc.; 2013: Monograph #1499.
6.	Epinephrine. In: Trissel LA. <i>Trissel's Stability of Compounded Formulations, 5rd Edition</i> . American Pharmaceutical Association; 2012: 186.
7.	Bupivacaine Hydrochloride. In: Trissel LA. <i>Trissel's Stability of Compounded Formulations, 5rd Edition</i> . American Pharmaceutical Association; 2012: 74.
8.	Epinephrine (Monograph). <i>United States Pharmacopeia XLII / National Formulary 37</i> . Rockville, MD. US Pharmacopeial Convention, Inc. 2019: 1615.
9.	Bupivacaine Hydrochloride (Monograph). <i>United States Pharmacopeia XLII / National Formulary 37</i> . Rockville, MD. US Pharmacopeial Convention, Inc. 2019: 596.
10.	USP <797>. <i>United States Pharmacopeia XLII / National Formulary 37</i> . Rockville, MD. US Pharmacopeial Convention, Inc. 2019: 6959.

DISCLAIMER: THIS DOCUMENT IS COPYRIGHT© 2020 MEDISCA PHARMACEUTIQUE INC. MEDISCA NETWORK INC., HEREBY REFERRED TO AS 'THE NETWORK', HAS PROVIDED THE FORMULA AND INSTRUCTIONS ABOVE AS A MODEL FOR EDUCATIONAL PURPOSES ONLY ON THE BASIS OF THE RECOGNIZED COMPENDIA AND TEXTS REFERENCED AT THE END OF THIS DOCUMENT. THE NETWORK TAKES NO RESPONSIBILITY FOR THE VALIDITY, SCHEDULING OR ACCURACY OF THIS INFORMATION OR FOR ITS SAFETY OR EFFECTIVENESS, NOR FOR ANY USE THEREOF, WHICH IS AT THE SOLE RISK OF THE LICENSED PHARMACIST OR OTHER APPROPRIATELY STATE LICENSED PROFESSIONAL. ADJUSTMENTS MAY BE NEEDED TO MEET SPECIFIC PATIENT NEEDS AND IN ACCORDANCE WITH A LICENSED PRESCRIBER'S PRESCRIPTION. THE PHARMACIST OR OTHER APPROPRIATELY STATE LICENSED PROFESSIONAL MUST EMPLOY APPROPRIATE TESTS TO DETERMINE THE STABILITY OF THIS SUGGESTED FORMULA. THE NETWORK CANNOT BE HELD LIABLE TO ANY PERSON OR ENTITY CONCERNING CLAIMS, LOSS, OR DAMAGE CAUSED BY, OR ALLEGED TO BE CAUSED BY, DIRECTLY OR INDIRECTLY, THE USE OR MISUSE OF THE INFORMATION CONTAINED IN THIS SUGGESTED FORMULA. IN ALL CASES IT IS THE RESPONSIBILITY OF THE LICENSED PHARMACIST OR OTHER APPROPRIATELY STATE LICENSED PROFESSIONAL TO KNOW THE LAW, TO COMPOUND ANY FINISHED PRODUCT AND TO DISPENSE THESE PRODUCTS IN ACCORDANCE WITH FEDERAL AND STATE LAW. MEDISCA NETWORK INC. MAKES NO WARRANTIES WITH RESPECT TO INFRINGEMENT OR NON-INFRINGEMENT BY THE FORMULA OF ANY PATENT OR OTHER INTELLECTUAL PROPERTY OF ANY OTHER PARTY, AND IT IS THE RESPONSIBILITY OF THE PHARMACIST OR OTHER APPROPRIATELY STATE LICENSED PROFESSIONAL TO INVESTIGATE AND DETERMINE ANY SUCH ISSUE.