MEDISCA® NETWORK INC.
TECHNICAL SUPPORT SERVICES
FORMULATION CHEMISTRY DEPARTMENT
TOLL-FREE: 866-333-7811
TELEPHONE: 514-905-5096
FAX: 514-905-5097
technicalservices@medisca.net

Suggested Formula	Bupivacaine Hydrochloride 0.5%, Epinephrine 1:200 000 Preservative Free Injection (Solution, 50 mL)	FIN	F 008 664

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	0.405	g				
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

Ingredient-Specific Information

Light Sensitive *(protect from light whenever possible):* *Epinephrine*

Air Sensitive *(protect from air whenever possible):* *Epinephrine*

MEDISCA® NETWORK INC.
TECHNICAL SUPPORT SERVICES
FORMULATION CHEMISTRY DEPARTMENT
TOLL-FREE: 866-333-7811
TELEPHONE: 514-905-5096
FAX: 514-905-5097
technicalservices@medisca.net

Suggested Formula	Bupivacaine Hydrochloride 0.5%, Epinephrine 1:200 000 Preservative Free Injection (Solution, 50 mL)	FIN	F 008 664

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 **5 to 9%** 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.

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 (GFIs) 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.

MEDISCA® NETWORK INC.
TECHNICAL SUPPORT SERVICES
FORMULATION CHEMISTRY DEPARTMENT
TOLL-FREE: 866-333-7811
TELEPHONE: 514-905-5096
FAX: 514-905-5097
technicalservices@medisca.net

Suggested Formula	Bupivacaine Hydrochloride 0.5%, Epinephrine 1:200 000 Preservative Free Injection (Solution, 50 mL)	FIN	F 008 664

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 §	0.405	g			
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.

MEDISCA® NETWORK INC.
TECHNICAL SUPPORT SERVICES
FORMULATION CHEMISTRY DEPARTMENT
TOLL-FREE: 866-333-7811
TELEPHONE: 514-905-5096
FAX: 514-905-5097
technicalservices@medisca.net

Suggested Formula	Bupivacaine Hydrochloride 0.5%, Epinephrine 1:200 000 Preservative Free Injection (Solution, 50 mL)	FIN	F 008 664

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:

	100%
MINUS	
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	_____

MEDISCA® NETWORK INC.
TECHNICAL SUPPORT SERVICES
FORMULATION CHEMISTRY DEPARTMENT
TOLL-FREE: 866-333-7811
TELEPHONE: 514-905-5096
FAX: 514-905-5097
technicalservices@medisca.net

Suggested Formula	Bupivacaine Hydrochloride 0.5%, Epinephrine 1:200 000 Preservative Free Injection (Solution, 50 mL)	FIN	F 008 664

3. **Ingredient quantification:**

A. Determine the quantity (in g) of Bupivacaine Hydrochloride to make a Bupivacaine Hydrochloride 0.5% Injection, batch size (50.0 mL):

Quantity of Bupivacaine Hydrochloride required for 50.0 mL	0.250 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 (5 to 9%)	1.05 to 1.09
EQUALS	
ii. Quantity of Bupivacaine Hydrochloride needed *plus* processing error adjustments	_____ **g**

4. † **Epinephrine 0.1% Stock Solution preparation:**

A. Incrementally add the Epinephrine (0.100 g) to the Sterile Water for Injection (90.0 mL).

Specifications: Continuously mix until all solid particles have completely dissolved. If necessary, add a few drops of Hydrochloric Acid 10% Solution to facilitate the dissolution.

End result: Homogeneous liquid-like solution.

B. Add additional Sterile Water for Injection to the mixture (Step 4A) to fill to the required batch size (100.0 mL).

Specifications: Continuously mix.

End result: Homogeneous liquid-like solution.

MEDISCA® NETWORK INC.
TECHNICAL SUPPORT SERVICES
FORMULATION CHEMISTRY DEPARTMENT
TOLL-FREE: 866-333-7811
TELEPHONE: 514-905-5096
FAX: 514-905-5097
technicalservices@medisca.net

Suggested Formula	Bupivacaine Hydrochloride 0.5%, Epinephrine 1:200 000 Preservative Free Injection (Solution, 50 mL)	FIN	F 008 664

5. **Medium integration:**

A. In the given order, sequentially add the following ingredients to the Sterile Water for Irrigation (40.0 mL plus processing error adjustments):

-Epinephrine 0.1% Stock Solution (0.25 mL plus processing error adjustments)
-Bupivacaine Hydrochloride (amount determined in Step 3Aii)
-Sodium Chloride

Specifications: Continuously mix until all solid particles have completely dissolved.

End result: Homogeneous liquid-like solution.

Note: Add the next ingredient, once the previous one has been completely added and dissolved.

6. **pH testing:**

A. Draw an appropriate amount of the mixture (Step 5A).

B. Test the pH of the sample. It should lie between 4.5 and 5.0.

C. If the pH > 5.0, carefully add, in a dropwise fashion, the Hydrochloric Acid 10% Solution to the mixture:

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.

IMPORTANT: Do not allow the pH to fall below 4.5.

7. **Filling to volume:**

A. Add additional Sterile Water for Irrigation to the above mixture to fill to the required batch size (50.0 mL *plus* processing error adjustments).

Specifications: Continuously mix until homogeneous.

End result: Homogeneous liquid-like solution.

8. **Filtering and transferring:**

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.

Suggested Formula	Bupivacaine Hydrochloride 0.5%, Epinephrine 1:200 000 Preservative Free Injection (Solution, 50 mL)	FIN	F 008 664

9.	**Filter integrity test:** 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.	**Terminal Sterilization:** 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.	**Sterility testing:** Validate the test sample for sterility and endotoxins, in accordance to current USP 797 regulatory guidelines.

SUGGESTED PRESENTATION

Estimated Beyond-Use Date		14 days, refrigerated, as per USP 797. BUD based on a successful sterility and 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	Consult your health care practitioner if any prescription or over-the-counter medications are currently being used or are prescribed for future use.
	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 refrigerated (2°C – 8°C). Do not freeze.	11	Do not take with alcohol, sleep aids, tranquilizers or other CNS depressants.
	6	May impair mental and/or physical ability. Use care when operating a car or machinery.	12	**Preservative free solution, single use only. Discard any unused portion.**
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.			

MEDISCA® NETWORK INC.
TECHNICAL SUPPORT SERVICES
FORMULATION CHEMISTRY DEPARTMENT
TOLL-FREE: 866-333-7811
TELEPHONE: 514-905-5096
FAX: 514-905-5097
technicalservices@medisca.net

Suggested Formula	Bupivacaine Hydrochloride 0.5%, Epinephrine 1:200 000 Preservative Free Injection (Solution, 50 mL)	FIN	F 008 664

REFERENCES

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