



Suggested Formula	Bupivacaine Hydrochloride 30 mg/mL Injection (Solution, 30 mL)	FIN	F 000 213v4
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### SUGGESTED FORMULATION

Ingredient Listing	Qty.	Unit	NDC #	Supplier	Lot Number	Expiry Date
Bupivacaine Hydrochloride (Monohydrate), USP	TBD					
Sodium Chloride, USP	0.12	g				
Sterile Water for Injection, USP	29.0	mL				
Sterile Water for Injection, USP	q.s. to 30.0	mL				

### SPECIAL PREPARATORY CONSIDERATIONS

#### Ingredient-Specific Information

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

*Bupivacaine Hydrochloride*





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### SPECIAL PREPARATORY CONSIDERATIONS (CONTINUED)

#### Suggested Preparatory Guidelines

Non-Sterile Preparation     Sterile Preparation

Processing Error / Testing Considerations: To account for processing error, sterility and endotoxin testing considerations during preparation, it is suggested to measure an additional **12 to 15%** 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.



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**SUGGESTED PREPARATION (for 30 mL)**

Weigh and / or measure the following ingredients when appropriate:

Ingredient Listing	Qty.	Unit	Multiplication factor (*): _____	Processing Error	Qty. to measure
Bupivacaine Hydrochloride (Monohydrate), USP §	TBD				
Sodium Chloride, USP §	0.12	g			
Sterile Water for Injection, USP §	29.0	mL			
Sterile Water for Injection, USP §	q.s. to 30.0	mL			

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

§ Weigh / measure just prior to use.

Preparatory Instruction

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

1.	<p><b><u>Equipment sterilization:</u></b></p> <p>Following the manufacturer's specifications, sterilize and depyrogenate all heat stable, reusable materials and equipment, then return to ambient temperature.</p>
2.	<p><b><u>Preparatory step:</u></b></p> <p>A. Prepare a hot water bath.</p> <p><u>Specifications:</u> Temperature: 48 to 53°C.</p>



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3. **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	
<b>i. Potency of Bupivacaine Hydrochloride, in decimal</b>	_____



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4.	<p><b><u>Ingredient quantification:</u></b></p> <p>A. Determine the quantity (in g) of Bupivacaine Hydrochloride to make a Bupivacaine Hydrochloride 30 mg/mL Injection, batch size (30 mL):</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="padding: 5px;">Quantity of Bupivacaine Hydrochloride required for 30 mL</td> <td style="text-align: right; padding: 5px;">0.900 g</td> </tr> <tr> <td colspan="2" style="padding: 5px;">DIVIDED BY</td> </tr> <tr> <td style="padding: 5px;">Potency of Bupivacaine Hydrochloride, in decimal (Step 3Ai)</td> <td style="text-align: right; padding: 5px;">_____</td> </tr> <tr> <td colspan="2" style="padding: 5px;">EQUALS</td> </tr> <tr> <td style="padding: 5px;"><b>i. Quantity of Bupivacaine Hydrochloride needed for 30 mL</b></td> <td style="text-align: right; padding: 5px;">_____ g</td> </tr> <tr> <td colspan="2" style="padding: 5px;">MULTIPLIED BY</td> </tr> <tr> <td style="padding: 5px;">Processing error adjustments (12 to 15%):</td> <td style="text-align: right; padding: 5px;">1.12 to 1.15</td> </tr> <tr> <td colspan="2" style="padding: 5px;">EQUALS</td> </tr> <tr> <td style="padding: 5px;"><b>ii. Quantity of Bupivacaine Hydrochloride needed <i>plus</i> processing error adjustments</b></td> <td style="text-align: right; padding: 5px;">_____ g</td> </tr> </table>	Quantity of Bupivacaine Hydrochloride required for 30 mL	0.900 g	DIVIDED BY		Potency of Bupivacaine Hydrochloride, in decimal (Step 3Ai)	_____	EQUALS		<b>i. Quantity of Bupivacaine Hydrochloride needed for 30 mL</b>	_____ g	MULTIPLIED BY		Processing error adjustments (12 to 15%):	1.12 to 1.15	EQUALS		<b>ii. Quantity of Bupivacaine Hydrochloride needed <i>plus</i> processing error adjustments</b>	_____ g
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5.	<p><b><u>Powder to medium integration:</u></b></p> <p>A. Using the hot water bath, in the given order, sequentially add the following ingredients to the Sterile Water for Injection (29.0 mL <i>plus</i> processing error adjustments):</p> <ul style="list-style-type: none"> <li>-Bupivacaine Hydrochloride (Monohydrate) (amount determined in step 4Aii)</li> <li>-Sodium Chloride</li> </ul> <p><b><u>Specifications:</u></b> Continuously mix until all solid particles have completely dissolved.    Maintain temperature between 48°C and 53°C.</p> <p><b><u>End result:</u></b> Homogeneous liquid-like solution</p> <p><b><u>Note:</u></b> Add the next ingredient, once the previous one has been completely added and dissolved.</p>																		
6.	<p><b><u>Cooling:</u></b></p> <p>A. Remove from the hot water bath and gently stir the homogeneous liquid-like solution (Step 5A) as it cools down to room temperature (20°C – 25°C).</p> <p><b><u>End result:</u></b> Homogeneous liquid-like solution.</p>																		



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7.	<p><b><u>Filling to volume:</u></b></p> <p>A. Add additional Sterile Water for Injection to the mixture (Step 6A) to fill to the required batch size (30.0 mL <i>plus</i> processing error adjustments).</p> <p><u>Specification:</u> Continuously mix.</p> <p><u>End result:</u> Homogeneous liquid-like solution.</p>		
8.	<p><b><u>Filtering and transferring:</u></b></p> <p>Aseptically filter the solution through a 0.22-<math>\mu</math>m 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>		
9.	<p><b><u>Filter integrity test:</u></b></p> <p>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.</p>		
10.	<p><b><u>Terminal Sterilization:</u></b></p> <p>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 specification.</p>		
11.	<p><b><u>Sterility and Endotoxin testing:</u></b></p> <p>Validate the Test sample for sterility and endotoxins, in accordance to current USP 797 regulatory guidelines.</p>		



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**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, unit dose injection vials.	
Auxiliary Labels	1	Use as directed. Do not exceed prescribed dose.	6	Keep at controlled room temperature, (20°C – 25°C), refrigerated (2°C – 8°C) or frozen (-25°C to -10°C).
	2	Keep out of reach of children.	7	Do not use if discolored.
	3	Equilibrate to room temperature before use.	8	Discard container after use.
	4	Discard in the presence of particulate matter.	9	Consult your health care practitioner if any prescription or over-the-counter medications are currently being used or are prescribed for future use.
	5	May impair mental and/or physical ability. Use care when operating a car or machinery.	10	Do not take with alcohol, sleep aids, tranquilizers or other CNS depressants.
Pharmacist Instructions	Add any auxiliary labels specific to the API to the dispensing container as deemed necessary.			
Patient Instructions	If adverse reactions occur, contact your pharmacist.			



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## REFERENCES

1.	USP <797> Pharmaceutical Compounding – Sterile Preparations. US Pharmacopeial Convention, Inc. <i>United States Pharmacopeia XXVIII / National Formulary 23</i> . Rockville, MD. 2004: 2461.
2.	Marcaine (Monograph). In: Canadian Pharmacists Association. <i>Compendium of Pharmacists and Specialties, 2003</i> .
3.	Sensorcaine (Monograph). In: Canadian Pharmacists Association. <i>Compendium of Pharmacists and Specialties, 2003</i> .
4.	Bupivacaine (Monograph). In: O’Neil MJ. <i>The Merck Index 13<sup>th</sup> Edition</i> . Whitehouse Station, NJ: Merck & Co, Inc.; 2001: 251.
5.	Buffered Isotonic Solutions. In: Martin A. <i>Physical Pharmacy, Fourth Edition</i> . Philadelphia, PA: Lipponcott Williams & Wilkins; 1993:169-89.
6.	Gennaro AR, ed. <i>Remington: The Science and Practice of Pharmacy, 20th Edition</i> . Baltimore, MD: Lippincott Williams & Wilkins; 2000: 613-27.
7.	Bupivacaine Hydrochloride (Monograph). In: Trissel LA. <i>Trissel’s Stability of Compounded Formulations, 2<sup>nd</sup> Edition</i> . American Pharmaceutical Association; 2000: 47.

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