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	Lidocaine Hydrochloride 1%, 2% Injection (Solution, 50 mL)	FIN	F 002 236v3

SUGGESTED FORMULATION

Ingredient Listing	Qty.	Unit	NDC #	Supplier	Lot Number	Expiry Date
Lidocaine Hydrochloride, USP	TBD					
Benzyl Alcohol (Parenteral Application), NF	1.0	mL				
Sodium Chloride, USP	TBD					
Sterile Water for Injection, USP	40.0	mL				
Sterile Water for Injection, USP	q.s. to 50.0	mL				
Sodium Hydroxide 1N Solution	As required					

SPECIAL PREPARATORY CONSIDERATIONS

Ingredient-Specific Information

Narrow Therapeutic Index *Lidocaine Hydrochloride*

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

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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, pH 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 (GFIs) and Compliance Policy Guides (CPGs).

Lidocaine Hydrochloride has a Narrow Therapeutic Index.

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 50 mL)

Weigh and / or measure the following ingredients when appropriate:

Ingredient Listing	Qty.	Unit	Multiplication factor (*): ____	Processing Error	Qty. to measure
Lidocaine Hydrochloride, USP §	TBD				
Benzyl Alcohol (Parenteral Application), NF §	1.0	mL			
Sodium Chloride, USP §	TBD				
Sterile Water for Injection, USP §	40.0	mL			
Sterile Water for Injection, USP §	q.s. to 50.0	mL			
Sodium Hydroxide 1N Solution §	As required				

* 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. **Equipment sterilization:**

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

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2. **Ingredient quantification:**

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

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

3. **Ingredient quantification:**

A. Determine the quantity (in g) of Lidocaine Hydrochloride to make a Lidocaine Hydrochloride 1% - 2% Injection, batch size (50 mL):

Quantity of Lidocaine Hydrochloride required for 50 mL	0.500 – 1.000 g
DIVIDED BY	
Potency of Lidocaine Hydrochloride, in decimal (Step 2Ai)	_____
EQUALS	
i. Quantity of Lidocaine Hydrochloride needed for 50 mL	_____ **g**

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4. **Ingredient quantification:**

Based on the desired concentration of the injection, determine the required quantity of Lidocaine Hydrochloride to weigh for a 50 mL batch:

Required concentration of Lidocaine Hydrochloride	Lidocaine Hydrochloride to weigh		Processing Error adjustments		Lidocaine Hydrochloride to weigh (plus processing error adjustments)
1%	Step 3Ai	Multiply	1.10 to 1.12	Equals	_____ g
2%	Step 3Ai		1.10 to 1.12		_____ g

5. **Ingredient quantification:**

Based on the desired concentration of the injection, determine the required quantity of Sodium Chloride to weigh for a 50 mL batch:

Required concentration of Lidocaine Hydrochloride	Sodium Chloride to weigh		Processing Error adjustments		Sodium Chloride to weigh (plus processing error adjustments)
1%	0.17 g	Multiply	1.10 to 1.12	Equals	_____ g
2%	0.06 g		1.10 to 1.12		_____ g

6. **Liquid preparation:**

A. Combine and mix the following ingredients together:

-Benzyl Alcohol (Parenteral Application)
-Sterile Water for Injection (40.0 mL *plus* processing error adjustments)

End result: Homogeneous liquid-like solution.

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7. **Powder to medium incorporation:**

A. In the given order, sequentially add the following ingredients to the homogeneous liquid-like solution (Step 6A):

-Lidocaine Hydrochloride (amount determined in Step 4)
-Sodium Chloride (amount determined in Step 5)

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.

8. **pH testing:**

A. Draw an appropriate amount of the mixture (Step 7A).

B. Test the pH of the sample. It should lie between 5.5 and 6.5.

C. If the pH < 5.5, carefully add in a dropwise manner the Sodium Hydroxide 1N Solution to the mixture:

1. Draw and transfer 1 or 2 drops of the Sodium Hydroxide 1N Solution to the mixture.
2. Stir for at least 5 minutes to evenly disperse the Sodium Hydroxide 1N Solution.
3. Re-test the pH.
4. Continue to add the Sodium Hydroxide 1N until the pH of 5.5 to 6.5 is obtained.

IMPORTANT: Do not allow the pH to rise above 6.5.

9. **Filling to volume:**

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

Specifications: Continuously mix.

End result: Homogeneous liquid-like solution.

10. **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.

11. **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.

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12.	**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 specification.
13.	**Sterility and Endotoxin testing:** 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		Discard container after use.
	2	Keep out of reach of children.	8		Protect from light.
	3	Keep at controlled room temperature, (20°C – 25°C), refrigerated (2°C – 8°C) or frozen (-25°C to -10°C).	9		Consult your health care practitioner if any prescription or over-the-counter medications are currently being used or are prescribed for future use.
	4	Do not take with alcohol, sleep aids, tranquilizers or other CNS depressants.	10		May impair mental and/or physical ability. Use care when operating a car or machinery.
	5	Discard in the presence of particulate matter.	11		Do not used if product changes color.
	6	Equilibrate to room temperature before use.			
Pharmacist Instructions		Add any auxiliary labels specific to the API to the dispensing container as deemed necessary. **IMPORTANT: TO BE ADMINISTERED ONLY BY THE PRESCRIBING PHYSICIAN.**			
Patient Instructions		Contact your pharmacist in the event of adverse reactions.			

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REFERENCES

1.	USP <797> Pharmaceutical Compounding – Sterile Preparations. US Pharmacopeial Convention, Inc. *United States Pharmacopeia XXVIII / National Formulary 23.* Rockville, MD. 2004: 2461.
2.	Benzyl Alcohol. In: Rowe RC. *Handbook of Pharmaceutical Excipients, 4th Edition*. American Pharmaceutical Association; 2003: 53.
3.	Lidocaine (Monograph). In: O'Neil MJ. *The Merck Index 13th Edition*. Whitehouse Station, NJ: Merck & Co, Inc.; 2001: 982.
4.	Lidocaine Hydrochloride (Monograph). US Pharmacopeial Convention, Inc. *United States Pharmacopeia XXVIII / National Formulary 23.* Rockville, MD. 2004: 1003.
5.	Lidocaine Hydrochloride. Thomson Micromedex. *USP DI – Drug Information for the Health Care Professional, 26th Edition.* Taunton, MA: US Pharmacopeial Convention, Inc; 2006: 1930.