MEDISCA® NETWORK INC.
TECHNICAL SUPPORT SERVICES
FORMULATION CHEMISTRY DEPARTMENT
TOLL-FREE: 866-333-7811
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Suggested Formula	Meropenem 50 mg/mL Injection (Preservative Free Solution, 10 mL)	FIN	F 008 727

SUGGESTED FORMULATION

Ingredient Listing	Qty.	Unit	NDC #	Supplier	Lot Number	Expiry Date
Meropenem, USP	TBD					
Sodium Carbonate, USP (Anhydrous)	0.0451	g				
Sterile Water For Injection, USP	5.0	mL				
Sterile Water For Injection, USP	q.s. to 10.0	mL				
Hydrochloric Acid 10% Solution	As required					
Sodium Hydroxide 10% Solution	As required					

Note: 10 ml of 50mg/ml will deliver 500 mg of Meropenem and 45.1mg of sodium as sodium carbonate (1.96 mEq).

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SPECIAL PREPARATORY CONSIDERATIONS

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 **20 to 25%** 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.

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SUGGESTED PREPARATION (for 10 mL)

Weigh and / or measure the following ingredients when appropriate:

Ingredient Listing	Qty.	Unit	Multiplication factor (*): ____	Processing Error	Qty. to measure
Meropenem, USP	TBD				
Sodium Carbonate, USP (Anhydrous)	0.0451	g			
Sterile Water For Injection, USP	5.0	mL			
Sterile Water For Injection, USP	q.s. to 10.0	mL			
Hydrochloric Acid 10% Solution	As required				
Sodium Hydroxide 10% 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 Meropenem based on the certificate of analysis:

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

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3. **Ingredient quantification:**

A. Determine the quantity (in g) of Meropenem to make a Meropenem 50 mg/mL Injection, batch size (10 mL):

Quantity of Meropenem required for 10 mL	0.500 g
DIVIDED BY	
Potency of Meropenem, in decimal (Step 2Ai)	_____
EQUALS	
i. Quantity of Meropenem needed for 10 mL	_____ **g**
MULTIPLIED BY	
Processing error adjustments (15 to 20%)	1.20 to 1.25
EQUALS	
ii. Quantity of Meropenem needed *plus* processing error adjustments	_____ **g**

4. **Medium integration:**

A. In the given order, sequentially add the following ingredients to the Sterile Water For Injection (5.0 mL plus processing error adjustments):

-Meropenem (amount determined in Step 3Aii)
-Sodium Carbonate

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.

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5. **pH testing:**

A. Draw an appropriate amount of the mixture (Step 4A).

B. Test the pH of the sample. It should lie between 7.3 and 8.3.

C. If the pH < 7.3, carefully add in a dropwise manner the Sodium Hydroxide 10% Solution to the mixture:

1. Draw and transfer 1 or 2 drops of the Sodium Hydroxide 10% Solution to the mixture.
2. Stir for at least 5 minutes to evenly disperse the Sodium Hydroxide 10% Solution.
3. Re-test the pH.
4. Continue to add the Sodium Hydroxide 10% Solution until the pH of 7.3 to 8.3 is obtained.

IMPORTANT: Do not allow the pH to rise above 8.3

D. If the pH > 8.3, carefully add in a dropwise manner 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 7.3 to 8.3 is obtained.

IMPORTANT: Do not allow the pH to fall below 7.3.

6. **Filling to volume:**

A. Add additional Sterile Water for Injection to the above mixture to fill to the required batch size (10.0 mL *plus* processing error adjustments).

Specifications: Continuously mix until homogenous.

End result: Homogeneous liquid-like solution.

7. **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.

8. **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.

9. **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.

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10.	**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		12 hours, refrigerated. BUD based on a successful sterility and endotoxin test result.	Packaging Requirements		Sterile, tightly closed, unit-dose injection vials.
Auxiliary Labels	1	Use as directed. Do not exceed prescribed dose.		6	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.		7	Do not use if discolored.
	3	Discard container after use.		8	Keep refrigerated (2°C – 8°C). Do not freeze.
	4	Equilibrate to room temperature before use.		9	Do not take with alcohol, sleep aids, tranquilizers or other CNS depressants.
	5	Preservative free solution, single use only. Discard any unused portion.		10	Slightly Hypertonic, inject slowly.
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.				

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REFERENCES

1. Parenteral Preparations. In: Allen, LV, Jr. *The Art, Science, and Technology of Pharmaceutical Compounding Fifth Edition.* American Pharmacists Association; 2016: 399.
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