MEDISCA® NETWORK INC.
TECHNICAL SUPPORT SERVICES
FORMULATION CHEMISTRY DEPARTMENT
TOLL-FREE: 866-333-7811
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Suggested Formula	Bacitracin 10,000 Units/mL Ophthalmic Liquid (Solution, 15 mL)	FIN	F 005 571v2

SUGGESTED FORMULATION

Ingredient Listing	Qty.	Unit	NDC #	Supplier	Lot Number	Expiry Date
Bacitracin, USP	150 000	Units				
Benzalkonium Chloride 1% Stock Solution †	0.3	mL				
Sodium Chloride, USP	0.042	g				
Sterile Water for Injection, USP	12.0	mL				
Sterile Water for Injection, USP	q.s. to 15.0	mL				
Hydrochloric Acid 10% Solution	As required					
Sodium Hydroxide 10% Solution	As required					
† **Benzalkonium Chloride 1% Stock Solution**						
Benzalkonium Chloride Solution (50%), NF	0.2	mL				
Sterile Water for Injection, USP	9.0	mL				
Sterile Water for Injection, USP	q.s. to 10.0	mL				

SPECIAL PREPARATORY CONSIDERATIONS

Ingredient-Specific Information

Light Sensitive *(protect from light whenever possible):* *Benzalkonium Chloride Solution,*

Hygroscopic *(protect from moisture whenever possible):* *Bacitracin, Benzalkonium Chloride Solution*

Air Sensitive *(protect from air whenever possible):* *Benzalkonium Chloride Solution*

Metal Reactive *(do not allow to come into contact):* *Benzalkonium Chloride Solution*

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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, pH testing and sterility testing considerations during preparation, it is suggested to measure an additional **15 to 20%** 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).

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 15 mL)

Weigh and / or measure the following ingredients when appropriate:

Ingredient Listing	Qty.	Unit	Multiplication factor (*): ____	Processing Error	Qty. to measure
Bacitracin, USP §	150 000	Units			
Benzalkonium Chloride 1% Stock Solution † §	0.3	mL			
Sodium Chloride, USP §	0.042	g			
Sterile Water for Injection, USP §	12.0	mL			
Sterile Water for Injection, USP §	q.s. to 15.0	mL			
Hydrochloric Acid 10% Solution §	As required				
Sodium Hydroxide 10% Solution §	As required				
† **Benzalkonium Chloride 1% Stock Solution**					
Benzalkonium Chloride Solution (50%), NF §	0.2	mL	---	---	
Sterile Water for Injection, USP §	9.0	mL	---	---	
Sterile Water for Injection, USP §	q.s. to 10.0	mL	---	---	

* Takes into account increased batch size conversions and density conversions, if required.
§ Weigh / measure just prior to use.

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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 (in units/mg) of Bacitracin based on the certificate of analysis:

	100%
MINUS	
Loss on drying result (from certificate of analysis)	_____ %
DIVIDED BY	100
EQUALS	
Quantity of dried Bacitracin, in decimal	_____
MULTIPLIED BY	
Assay on dried basis (from Certificate of Analysis)	_____ units/mg
EQUALS	
i. Potency of Bacitracin in (units/mg)	_____ **units/mg**

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3. **Ingredient quantification (units per weighted measure adjustment):**

A. Determine the quantity (in g) of Bacitracin required to make a 15 mL batch of Bacitracin 10,000 Units/mL Ophthalmic Liquid:

Quantity of Bacitracin (in Units) needed for 15 mL	150,000 Units
DIVIDED BY	
Bacitracin potency, in (units/mg) (Step 2Ai)	_____ Units/mg
EQUALS	
i Quantity of Bacitracin (in milligrams) needed for 15 mL	_____ **mg**
MULTIPLIED BY	
Multiplication factor – milligrams to grams	0.001
EQUALS	
ii Quantity of Bacitracin (in grams) needed for 15 mL	_____ **g**
MULTIPLIED BY	
Processing error adjustments (15 to 20%)	1.15 to 1.20
EQUALS	
iii Quantity of Bacitracin needed *plus* processing error adjustments	_____ **g**

4. † **Benzalkonium Chloride 1% Stock Solution preparation:**

A. Incrementally add the Benzalkonium Chloride Solution (50%) (0.2 mL) to the Sterile Water for Injection (9.0 mL).

Specifications: Continuously mix.

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 (10.0 mL).

Specifications: Continuously mix.

End result: Homogeneous liquid-like solution.

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5. **Powder-liquid preparation:**

A. In the given order, sequentially add the following ingredients to the Sterile Water for Injection (12.0 mL *plus* processing error adjustments):

-Sodium Chloride
-Benzalkonium Chloride 1% Stock Solution (0.3 mL *plus* processing error adjustments)
-Bacitracin (amount determined in Step 3 Aiii)

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 5.5 and 6.5.

C. If the pH < 5.5, carefully add 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 5.5 to 6.5 is obtained.

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

D. If the pH > 7.0, carefully add 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 5.5 to 6.5 is obtained.

IMPORTANT: Do not allow the pH to fall below 5.5.

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7.	**Filling to volume:** A. Add additional Sterile Water for Injection to the above mixture to fill to the required batch size (15.0 mL *plus* processing error adjustments). Specifications: Continuously mix. 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 containers (see Packaging requirements). Transfer the remainder into separate dispensing containers. These are to be used as the Test samples for sterility testing.
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 samples for sterility, in accordance to current USP 797 regulatory guidelines.

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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.	Packaging Requirements		Sterile, tightly closed, light-resistant ophthalmic dropper bottle.
Auxiliary Labels	1	Use as directed. Do not exceed prescribed dose.		7	For ophthalmic use only.
	2	Keep out of reach of children.		8	Consult your health care practitioner if any prescription or over-the-counter medications are currently being used or are prescribed for future use.
	3	Do not use if product changes color.		9	Cap tightly after use.
	4	Keep at controlled room temperature, (20°C – 25°C), refrigerated (2°C – 8°C) or frozen (-25°C to -10°C).		10	Do not allow the dropper tip to come into contact with the body or any type of surface in order to prevent contamination.
	5	Protect from light.		11	Equilibrate to room temperature before use.
	6	Discard in the presence of particulate matter.			
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. **IMPORTANT:** The quantity of API administered is directly dependent on the quantity of product applied.				

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