Pulmonary Diagnostics: Reconstitution of Methacholine

Site Applicability

St. Paul's Hospital
Mount Saint Joseph Hospital

Practice Level

Respiratory Therapist

Requirements

Dosing protocol is determined by the Pulmonary Function Lab in accordance with European Respiratory Journal MCT guidelines.

General Information

Methacholine is a cholinergic agonist administered by Respiratory Therapists via nebulization in the Pulmonary Function Lab for the purpose of methacholine challenge testing (MCT) B-00-12-12116).

Methacholine requires reconstitution and dilution by pharmacy personnel or trained Respiratory Therapists prior to use.

The recommended dosage of methacholine for MCT is increasing concentrations of methacholine solution using either doubling or quadrupling dosing concentrations.

Need to Know

Reconstituting methacholine powder and nebulized methacholine aerosol may cause bronchoconstriction. As such, an N95 fit-tested respirator and gloves must be worn during methacholine handling and administration.

> *NOTE: Pregnant or breast feeding healthcare providers should not be involved in the reconstitution or administration of methacholine.*

Methacholine is supplied in amber glass vials that contain 100 mg of methacholine powder. Unopened vials should be stored in a cool, dry place (temperature between 15 °C to 30 °C).

Reconstituted methacholine can be stored at **room temperature** for up to 4 hours.

Equipment and Supplies

Methacholine Chloride 100 mg vial

0.9% Sodium Chloride 10 mL vial

Alcohol Swab (2)

10 mL Luer Lock Sterile Syringe

5 mL Luer Lock Sterile Syringe

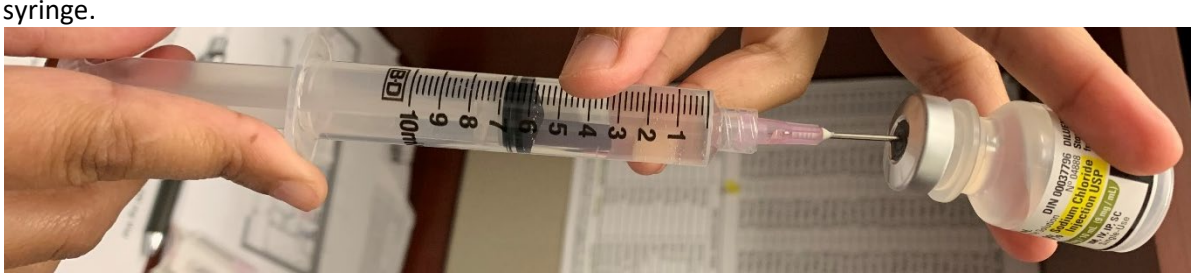
18 Gauge Needle (3)

0.2 Micron Filter

Procedure

Steps

1. Perform hand hygiene and don appropriate PPE.
2. Remove and discard dust cap from both the methacholine 100 mg vial and 0.9% sodium chloride vial.
3. Wipe each vial bung with 3 firm swipes using an alcohol swab.
4. Attach an 18 gauge needle to the 10 mL syringe and draw up 6.25 mL of air into the syringe.
5. Insert the syringe into the 0.9% sodium chloride vial and inject the air into the vial. Draw up 6.25 mL of sodium chloride into the 10 mL syringe and ensure that there are no air bubbles in the syringe.



6. Inject the 6.25mL of 0.9% sodium chloride into the methacholine 100 mg vial to yield a 16 mg/mL solution. Draw up 6.25 mL of air into the 10 mL syringe to equalize the pressure before removing the syringe from the vial.
7. Discard sharps into sharps container and agitate the methacholine vial to obtain a clear solution.

   NOTE: At this point, reconstituted methacholine can remain in the vial at room temperature for up to 4 hours.
8. Wipe the vial bung of the reconstituted methacholine vial with 3 firm swipes using an alcohol swab.
9. Attach a new 18 gauge needle to the 5 mL syringe and draw up 3 mL of air into the syringe.
10. Insert the syringe into the methacholine vial and inject the air into the vial. Draw up 3 mL of the methacholine 16 mg/mL solution.
11. Remove the needle from the syringe and discard into sharps container. Attach a 0.2 micron filter to the syringe then attach a new 18 gauge needle to the luer-lock end of the filter.

12. Expel methacholine through the filter into a disposable nebulizer cup. Dispose of sharps into the sharps container and discard excess methacholine into a Stericycle.

Related Documents

1. Approved Drug List for RT Administration (Staff Only)
2. B-00-12-12116 Methacholine Challenge Testing

References

1. https://methapharmrespiratory.com/wp-content/uploads/2022/08/USA-Provo-PI-Powder.pdf
2. http://shop.healthcarebc.ca/phc/PHCDSTs/B-00-12-12116.pdf
3. PHC Pharmacy

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Approved By:	PHC
	Professional Practice Leader, Respiratory Services Pulmonary Diagnostics Coordinator, Respiratory Services Medical Director, Pulmonary Function Lab Supervisor, PHC Pharmacy
Owners:	PHC
	Respiratory Services