XenoVAP™
DISPOSABLE ADMINISTRATION SYSTEM
FOR VENTILATOR PATIENTS
OPERATION MANUAL

060-139

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XenoVAP™ DISPOSABLE ADMINISTRATION SYSTEM FOR VENTILATOR PATIENTS

Instructions for Use:

This inexpensive, disposable device is used to both administer Xenon-133 and to collect the expired gas on ventilator-assisted patients. Made entirely of plastic, the system is used for one patient only and then discarded after the Xenon has been allowed to decay or has been exhausted from the collection bag.

The system consists of a manually operated ventilator assist pump (VAP), an injection site for the administration of Xenon-133, CO₂ Absorber and Oxygen Inlet for filling a 35-liter collection bag.

The Patient is removed from the device providing ventilation assistance and placed on this system. This system is used to provide assistance for the short period of time to allow the patient to stabilize and become comfortable. Xe-133 is then injected into the system, the VAP is squeezed and held either until sufficient counts are collected by the gamma camera system or the patient must breathe. The VAP is squeezed and released forcing the patient to breathe through the
system to collect an "equilibrium phase" image. When sufficient data has
been collected, the appropriate valve is opened and the patient breathes
room air and exhales the Xe-133 into a collection bag until the bag is full
enough to offer resistance. When the valve is opened, the gamma camera
system should immediately begin collecting data for the "washout phase"
image. When the study is completed the entire rebreathing system is then
placed in a hood or another area for safe disposal of the radioactive Xe-
133 in accordance with pertinent regulations and conditions of your licens-
es to use radioactive materials.

Procedure:

1. Position an IV pole on any convenient side of the detector head so that
   the pole is out of the field of view of the camera system.
2. For your convenience, a pre-filled, dust-free soda lime cartridge (D) is
   provided at no extra charge.
3. Suspend the Rebreathing System from the IV hanger using the hanger
   hole in the collection bag. All air hose connections should be checked to
   make sure they are properly connected and do not leak air. One should
   ensure that all necessary materials and personnel are present and each
   person knows exactly what to do.
4. Position the patient and rebreathing unit with collection bag (E) out of the
   view of the camera.
5. Clamp tubing closed at position (1) with a kelly clamp.
6. Be sure that the room vent plug (G) is readily removable. To test, exert
   sufficient force to remove it and re-seal it in a manner which will maintain a
gas seal, yet allow removal.
7. Remove plug from O₂ Inlet (F), attach O₂ tubing and add O₂ to collection
   bag (E). Experience will indicate the amount necessary but about half-full is
   usually sufficient.
   **NOTE:** Care must be taken not to overfill collection bag (E), since the last
   phase (washout) of the procedure requires that a few exhalations of the pa-
tient must go into the collection bag (E). After O₂ has been added to the
system, turn off the O₂ source and leave it connected to the system in
   case more is needed.
8. Place the patient in the desired orientation to the camera face.
9. With a flood source, check to see that the patient’s lungs are totally
   included in the detector/collimator field of view.
10. Explain the procedure to the patient and when ready to begin: Remove
    the present respirator from the patient's endotracheal tube and connect this
    system to the patient. Release the kelly clamp from the tubing position (1).
    **Have an experienced person operate the VAP until both the patient**
and the operator are comfortable with the procedure.

**NOTE: If you do not desire a "single breathing study," skip step 11, and continue with Step 12 for the equilibrium phase.**

11. Clamp the air tube closed at position (2). Immediately inject the Xe-133 into injection site (C) and squeeze the VAP vigorously. Start the camera now. Hold the VAP until either sufficient counts are collected by the gamma camera system or the patient must breathe, then immediately remove the clamp from position (2) and proceed to Step 12.

12. If you skipped step 11, inject the Xe-133 into injection site (C) now.) Alternately squeeze and release the VAP, manually ventilating the patient. The camera should be started to collect the "equilibrium phase" data. More O₂ may be added to the system if required. Adding O₂ is rarely necessary.

**NOTE: The patient is breathing in a closed circuit.**

13. When sufficient data is collected, clamp tubing closed at position (1) with Kelly Clamp and simultaneously remove cap from room vent (G). Immediately start the gamma camera to collect the "washout phase" images. Patient is now breathing room air and exhaling the Xe-133 into the Collection Bag (E). Continue to collect the air until either the bag is full enough to offer resistance, the "washout phase" is finished, or very few counts are being collected by the gamma camera system.

14. Prepare the normal ventilator for reattachment to the patient.

15. Clamp tubing closed at position (2) and quickly remove the disposable rebreathing system from the patient and reconnect the normal ventilator.

16. Place entire unit with kelly clamps in place in a hood or other area for decay storage. Gas may be released in accordance with state and/or NRC directions and your license. The gas may be discharged by releasing the clamps and collapsing the collection bag. If the gas is to be stored for an appreciable length of time, leave kelly clamps in place.

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