



## **Cleaning Procedures – Bloodborne Computerized Pneumatic Tube Transport Systems**

There are no official regulations presently in effect relating to the decontamination of pneumatic tube systems to transport body fluids. Therefore, Pevco suggests the following procedures based on guidelines developed by the Centers for Disease Control and adopted by the Occupational Safety and Health Administration, National Institutes of Health, and the National Committee for Clinical Laboratory Standards. Manufacturers of various materials used in the construction of pneumatic tube systems also were consulted to ensure that no damage to the tube system would occur as a result of using recommended germicides, tuberculocides, or decontamination procedures.

**This publication is intended to provide guidelines for decontamination use.** It is not intended to supersede existing institutional policies and procedures. If there is reason to believe that airborne contaminants are present; an alternative procedure that does not require the use of system blowers is available and should be used.

### **I. MECHANICAL RESPONSE TO SUSPECTED CONTAMINATION**

When it is suspected that contamination has occurred within the system, the following steps should be taken:

- A. Turn off the system at the affected zone or master control (computer).
- B. Notify all users that contamination is suspected and the system will not be available until further notice. Carriers should be left where they are until the risk of contamination is evaluated.
- C. Determine the route of the affected carrier using the transaction printout and note on a mechanical riser of the system.
- D. Determine if subsequent carriers have traveled through the contamination route after the spill occurred. Determine their route after passing the contaminated area and note on a mechanical riser of the system.
- E. Isolate contaminated carriers or devices. Sterilize, disinfect or destroy any contaminated carriers or inserts according to paragraph III or hospital procedures.
- F. Advise personnel who have handled contaminated carriers to take appropriate measures.



## II. DISINFECTING THE TUBE SYSTEM

CAUTION: Persons performing this procedure must wear rubber gloves and protective gowns.

- A. Tape the pressure relief valve of the sending and receiving station closed.
- B. From the computer, place the dispatcher in line and the slide plate out at the originating station by selecting the following commands from the diagnostic menu. Set a path from the blower to the affected originating send station.
- C. Have the following items ready for use at the originating send station:
  1. Container of disinfect solution (a 1:10 solution of 5.25% Sodium Hypochlorite or EPA approved hospital disinfectant solution used at your facility). Avoid cleaners that leave a sticky residue. (Sodium Hypochlorite must be made fresh each time.)
  2. A foam ball or cylinder of the same or slightly greater diameter than your tube system.
  3. Plastic bag and tape. Bag should be at least a one-gallon size or greater.
- D. Saturate (not dripping) the foam ball with the solution while wearing rubber gloves and protective gown. Place the ball into the computer.
- E. Notify the computer operator you are ready to send the saturated ball.
- F. Select the vacuum mode from the computer.

Run blower in the vacuum mode until the View Path software shows the ball arrived at the turnaround point. The turnaround point is the point at which the carrier would have stopped in order to take the shortest route to the receiving station. Refer to the riser diagram. Set blower to the Idle I mode.

- G. Notify the person at the originating send station when the computer acknowledges blower is in Idle I that the ball is ready to return. The sending station person should tape the plastic bag to the dispatcher and the back of the station in preparation to receive the ball. Leave an opening in the top of the bag to serve as a vent for the large volume of air.



- H. Notify the computer operator you are ready to receive the ball when the bag is attached. The computer operator will then select the pressure mode and run the blower until the ball drops into the plastic bag. After the ball arrives, set the blower to Idle II.
- I. Repeat steps A-H with the ball half way saturated.
- J. Repeat steps A-H with the liquid squeezed out of the ball.

Run the blower for five (5) minutes or until the system is dry.

- K. Perform the following steps as clean-up measures after the procedure is completed.
  - 1. Remove tape from the pressure relief valves at both stations.
  - 2. Saturate (not dripping) a rag with the disinfecting solution, wipe the pressure relief valve.
  - 3. Clean the dispatcher and the inside of the station to remove any residue.
  - 4. Clean the carrier detectors (on the dispatcher and slideplate) using a cotton swab or long Q-tip and alcohol.

### III. CARRIER DISINFECTING

- A. Remove rubbing bands (riding rings) from the carrier and discard as you would other contaminated material.
- B. Disinfect using EPA approved hospital disinfectant detergent solution according to manufacturer's recommendations and/or hospital procedures. A 1:10 solution of 2.5% Sodium Hypochlorite may be used. This must be made up fresh each time. ***Do NOT use chemical disinfectants that contain formalin, formaldehyde, or forms thereof in disinfecting the carriers.***
- C. Dry carrier and install new rubbing bands (riding rings).

#### References:

Centers for Disease Control, Hospital Infection Program.  
National Committee for Clinical Laboratory Standards: NCCLS m29-T2.  
National Institutes of Health, Department Bio-Safety.  
Occupational Safety and Health Administration: 29 CFR Part 1910.1030.  
Occupational Safety and Health Administration: 29 CFR Part 1910.1200(e).  
Occupational Safety and Health Administration Instruction: CPL 2.2.44c.



## **Cleaning Procedure – Airborne Computerized Pneumatic Tube Transport System**

There are no official regulations presently in effect specifically relating to the decontamination of pneumatic tube systems used to transport body fluids. Therefore, Pevco has based these suggested procedures on guidelines developed by the Centers for Disease Control and adopted by the Occupational Safety and Health Administration, National Institutes of Health, and the National Committee for Clinical Laboratory Standards. Manufactures of various materials used in the construction of pneumatic tube systems were also consulted to ensure that no damage to the system would occur as a result of using recommended germicides, tuberculocides, or decontamination procedures.

### **I. EXPOSURE CONTROL**

- A. Follow universal precautions since all body fluids are potentially infectious.
- B. Wear rubber gloves and protective gown.
- C. Discard the bag, specimen and container according to hospital policy if leakage has occurred.
- D. Refer to the cleaning procedures if the carrier, insert, or other system components have been contaminated.

### **MECHANICAL RESPONSE TO SUSPECTED CONTAMINATION**

When it is suspected that contamination has occurred within the system, the following steps should be taken:

- A. Turn off the system at the affected zone or master control (computer).
- B. Notify all users that contamination is suspected and the system will not be available until further notice. Carriers should be left where they are until the risk of contamination is evaluated.
- C. Determine the route of the affected carrier using the transaction printout and note on a mechanical riser of the system.
- D. Determine if subsequent carriers have traveled through the contamination route after the spill occurred. Determine their route after passing the contaminated area and note on a mechanical riser of the system.



- E. Isolate contaminated carriers of devices. Sterilize, disinfect, or destroy any contaminated carriers and/or inserts according to paragraph IV or hospital procedures.
- F. Advise personnel who have handled contaminated carriers to take appropriate measures.
- G. Determine if the spill did contaminate the primary route of the carrier.
  - 1. Insert an electrician's snake (of sufficient length to reach the first diverter) into the pneumatic transmission tubing from the sending station to the diverter closet to the station.
  - 2. Attach sufficient dry cleaning rags to the end of the snake in order to fill the inside diameter of the tube. Also, attach a larger plumber's snake from the diverter end of the transmission tubing. Pull the cleaning rags and plumber's snake back to the station. Examine the rags to verify that the spill occurred in that section of tubing.
  - 3. Proceed to paragraph III.B (Disinfecting Transmission Tubing) if it is determined that some spillage of the biological specimen did occur in that section of tubing.
  - 4. Repeat steps 1-3 for each section of tubing identified in paragraphs II.C and II.D.

#### **DISINFECTING THE TUBE SYSTEM**

- A. Disinfect the pressure relief valves. Above each station there is a pressure relief valve that must be disinfected and cleaned. Wipe the plastic flapper and the valve with germicidal detergent solution.
- B. Disinfect the transmission tube sections.
  - 1. Saturate (not dripping) cleaning rags with appropriate disinfecting or germicidal detergent solution. Wring out excess solution and attach to the end of the plumber's snake. Pull the snake back to the diverter leaving the electrician's snake attached. When the rags are received at the diverter end of the tube section being disinfected, they should be saturated (not dripping) again with the disinfecting solution and pulled



back to the receiving end. This process should be continued for 20-30 minutes.

2. Allow the solution to air dry for the next 30 minutes.
3. Pull a final set of clean dry rags through the system.
4. Blow air through the system to further dry the tubing. Set the path to the desired station at the master control (computer). Turn the blower on to Pressure for 15 minutes
5. Disinfect the pressure relief valve at each station with germicidal detergent only.

C. Blow air through each line for 15 minutes when disinfecting is completed.

#### **CARRIER STERILIZATION AND DISINFECTING**

A. Sterilize carriers.

1. Remove the rubbing bands (riding rings) from the carrier and discard as you would other contaminated material.
2. Sterilize carriers using standard ethylene oxide sterilization procedures.
3. Dry carrier and install new rubbing bands (riding rings) on the carrier.

B. Disinfect carriers.

1. Remove the rubbing bands (riding rings) from the carrier and discard as you would other contaminated material.
2. Disinfect carriers using germicidal detergent solution according to manufacturer's recommendations and/or hospital procedure. ***Do NOT use chemical disinfectants that contain formalin, formaldehyde, or forms thereof in disinfecting the carriers.***
3. Dry carrier and install new rubbing bands (riding rings).

#### **TURBO DISINFECTION**



In cases where the spill of biological specimen is found in the carrier braking system near the blower and first diverter, the following procedure should be used:

- A. Disinfect air diode housings by wiping with germicidal detergent solution.
- B. Dry parts completely and reassemble.

#### **SUMMARY RECOMMENDATIONS**

- A. The most important safeguard to avoid spills of biohazard material in the pneumatic tube system is to properly package the specimens prior to transport. Surrounding specimens with foam inserts will reduce or eliminate breakage. Enclosing the specimens in leak-proof, puncture-resistant plastic bags can contain spills. Double bagging biohazard material is recommended.
- B. The carriers can be sterilized with ethylene oxide gas or disinfected with appropriate germicidal detergent solutions.
- C. Cold chemical disinfectant solutions can be used on the galvanized tubing; however, they do have some slight effect on the material. For example, oxidization from formaldehyde mixtures and staining from iodophor mixtures. Germicidal detergent solutions can be used safely with minimal attack when used in their recommended diluted state.

#### References:

Centers for Disease Control, Hospital Infection Program.  
National Committee for Clinical Laboratory Standards: NCCL m29-T2.  
National Institutes of Health, Department Bio-Safety.  
Occupational Safety and Health Administration: 29 CFR Part 1910.1030.  
Occupational Safety and Health Administration: 29 CFR Part 1910.1200(e).  
Occupational Safety and Health Administration Instruction: CPL 2.2.44c.



### **Clean-Out (Cylinder) Carrier Instructions**

Clean-out carriers come in a variety of shapes and sizes, but all serve the same purpose to clean up spills that occur in the pneumatic tube system. These carriers are larger in the rubbing bands (riding rings) area to form a tighter fit in the line, which helps to blot the spill.

They are inserted into the system the same way the standard carrier is, through the station inlet (dispatcher). They can be manually maneuvered through the pipe network to the area of the spill to effect clean up. Passing the carrier over the spill then removing it and wiping the bands (rings) several times may be necessary until the spill is blotted.

Due to the larger rubbing bands (riding rings) and the resulting tighter fit, the carrier will not discharge at a station as the standard carrier does. It is necessary for the maintenance technician to intervene in its removal. The carrier can be discharged at an unused port of any diverter or by blowing the carrier into a station while the receiver plate is in the OUT-OF-LINE position. Occasionally, the pressure relief valve flapper may also need to be held in the closed position so the carrier will be propelled all the way to the station inlet.

The clean-out carrier should not be required often. Frequent spills indicate that the loading procedures need to be reviewed for use of improper containers or padding.