



## **Pulmonary Function Testing**

HKTS and ACCP (HK & Macau Chapter)

### **Introduction**

Pulmonary function testing (PFT) involves forced expiratory maneuvers, often in enclosed spaces and in close proximity to the technician. Also, the same equipment serves multiple patients with the same day. The procedure therefore carries a theoretical risk of transmitting respiratory infections from patient to staff and from patients to patients.

### **Patient selection**

- Patients with (a) fever, (b) recent onset of sorethroat, runny nose or cough, (c) unexplained shadows in the chest radiograph, (d) known active transmissible respiratory illness, e.g. influenza, TB, SARS, should not be subjected to PFT.
- For patients recovering from SARS, at least 8 weeks from onset of illness or 4 weeks after discharge from hospital, whichever is longer.

### **The Venue**

- Adequate air exchange of at least 6 air-changes per hour, ideally with unidirectional air flow from the corridor through the PFT room then to the exhaust near the windows.
- Room door is closed during PFT procedure to maintain negative pressure within the room.
- A portable HEPA filter air purifier may be placed near the subject to facilitate removal of airborne particulates generated by the breathing maneuvers of the subject, particularly if air-changes within the room is suboptimal. However, its use must be balanced against theoretical risk of generating local turbulence.

### **Personal protective equipment**

- The technician should wear uniform or working clothes, with linen gown as outer clothing.
- The technician must wear a surgical mask. Use of N95 mask instead of surgical mask is optional.
- Hand hygiene by good hand-washing or alcohol hand-rub in between testing sessions and before and after handling any subjected-related equipment.
- Gloves should be used when removing the mouthpiece from a breathing circuit after it has been used or when handling body fluids of concern.

### **Operation**

- A disposable single-use bacterial and viral filter with a filtration efficiency of

99.9% should be used on each patient.

- Flow sensor and breathing circuit tubing connected to the flow sensor should be changed daily for cleaning and disinfection.
- Front panel, patient chair and equipment arm inside the body-box should be covered by disposable plastic bag. The plastic bags should be changed after each patient-use.
- The door of the body-box should be closed during the PFT procedure and should only be opened after the subject has completed the maneuver and have ceased coughing.
- The air outlet of the body-box should be connected to a HEPA filter.
- If the breathing maneuvers have to be done outside the body-box, the technician should be on the side of air-inlet and at least 3 feet away from the subject.
- Metered-dose inhalers and not nebulisers should be used for bronchodilator-benefit studies.



Body box chair



Outlet HEPA filter

### **Cleaning and disinfection**

- The interior of the body-box, including the tubings, the floor and the front panel, should be cleaned with 70% alcohol after each patient-use.
- Breathing circuits, valves and plastic tubings should be disinfected either by heat washing or by a suitable disinfectant.
- Flow sensors should be disinfected by a suitable disinfectant and then rinsed well with water before allowing to air-dry.
- Reusable mouthpiece and nose-clips must be disinfected after each use.

*The information and opinions expressed in these guidelines are provided to the best of our knowledge and understanding at the time of drafting (January 2004), and must be cross-referred to the most updated literature upon application.*