

## IPC PLUS TRIAL STANDARD OPERATING PROCEDURE

# PLEURAL MANOMETRY

**This SOP applies only to those patients who have an IPC in place for the purposes of the IPC-PLUS trial**

Pleural manometry will take place immediately following IPC insertion, during the patient's first drainage, ideally at the end of the IPC insertion procedure. It aims to measure the intrapleural pressures as increasing volumes of pleural fluid are removed. The recordings taken should be entered onto the IPC insertion CRF in the appropriate section. If drainage and measurements are to take place separate to IPC insertion, then full aseptic technique should be maintained when accessing the IPC.

Patients should ideally be sat up to perform manometry, in order to increase the chances of the drain sitting in the dependent portion of the fluid collection. Normal pleural pressures in non-trapped lungs are typically around -3 to -5 cmH<sub>2</sub>O. Values in trapped lung may be significantly lower.

### Equipment

- Mirador Biomedical Compass Thoracentesis single-use manometer (**figure 1**)
- Drainage adapter line for PleurX catheter (**figure 2**)
- 2 x 3-way taps – referred to as 3WT-A and 3WT-B
- Equipment for aspiration (e.g. Armstrong Medical aspiration kit; or 50 ml syringe, IV giving set tubing and fluid receptacle)
- Extra 50 ml luer-lock syringe for fluid sample (Southmead and Oxford sites only – trial samples; All sites - any clinical samples if needed)



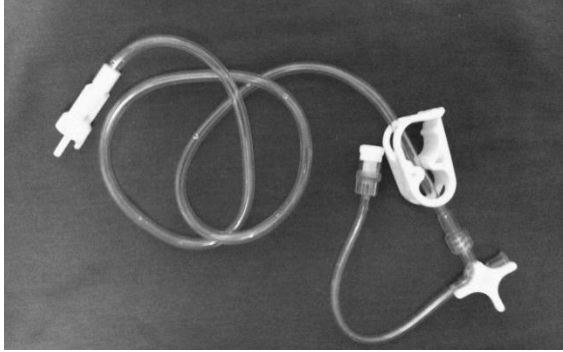
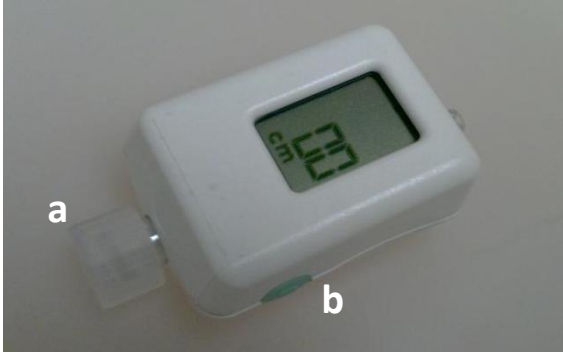
**Figure 1.** Pleural manometer and packaging

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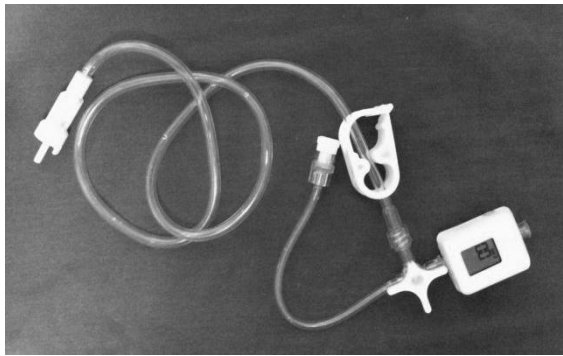




**Figure 2.** PleurX drainage adaptor line

### Procedure

<p>1. Prepare the above equipment onto sterile field. Ensure aseptic technique is used for pleural manometry</p>	
<p>2. Connect the drainage line to a female port on 3WT-A (<b>figure 3</b>).</p> <p>Do not attach to the IPC at this stage.</p>	 <p><b>Figure 3.</b> Attach adaptor to 3WT-A</p>
<p>3. Turn the manometer on by holding down the green button on the side (<b>figure 4</b>).</p> <p>Ensure this reads 00 initially. Remove the luer cap on the rear port.</p>	 <p><b>Figure 4.</b> Turn on the manometer by pressing button (b) and remove luer cap (a)</p>

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<p>4. Connect the male non-luer end of the manometer to the remaining female port on 3WT-A (<b>figure 5</b>).</p>	 <p><b>Figure 5.</b> Connect the manometer to 3WT-A</p>
<p>5. Connect the male (luer) end of 3WT-B to the free port at the back of the manometer.</p>	
<p>6. Connect aspiration kit/set-up to free ports on 3WT-B as needed.</p>	
<p>7. Connect drainage line to IPC.</p>	
<p>8. Aspirate a small amount of fluid to prime the circuit, ensuring there is no air left in line with the manometer. You should see the reading on the manometer become markedly negative as the plunger on the syringe is pulled back.</p>	
<p>9. Close 3WT-B to the manometer (<b>figure 6</b>). The reading on the manometer should now reflect pleural pressures. Pleural pressure will vary with normal respiratory motion. Allow at least 3-5 respiratory cycles of quiet breathing for the system to equalise.</p> <p><b>Take a note of the typical END-EXPIRATORY pressure reading at this point, aiming for the same value to be obtained on at least four occasions before recording on the CRF.</b></p> <p><b>Ensure that the manometer is held at the same level throughout the procedure, and that it is at roughly the same level as the pleural effusion (figure 7). Moving the device significantly above or below this point will lead to marked variation in readings.</b></p>	 <p><b>Figure 6.</b> Position of 3 way taps to allow pressure readings from manometer.</p>  <p><b>Figure 7.</b> Ensure the manometer is read while at the same level as the effusion</p>

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10. Re-open 3WT-B to the IPC system and aspirate / expel fluid as per usual.	
11. Record pleural pressures every 100-200 mls, using step 8 above. Enter the appropriate value on the CRF.	
12. Remove as much fluid as defined by the current protocol, or as allowed by patient symptoms. Send samples for clinical or trial tests as required.	
13. The final pressure measurement is valid when at least 20 mls of fluid can still be withdrawn from the pleural cavity.	

### **ASPIRATION SHOULD BE TERMINATED IN THE EVENT OF:**

- PATIENT DISCOMFORT, ESPECIALLY CHEST PAIN.
- SIGNIFICANT PATIENT COUGH.
- END-EXPIRATORY PLEURAL PRESSURE READINGS BELOW -20 cmH<sub>2</sub>O.

### **PLEURAL PRESSURE MEASUREMENTS SHOULD BE STOPPED IN THE EVENT OF:**

- NO FURTHER FLUID DRAINAGE.
- AIR BEING ASPIRATED FROM THE CHEST.

### **Further reading / references.**

- Doelken *et al.* Pleural Manometry: Technique and Clinical Implications. Chest 2004; 126 (6): 1764-9.
- Lan *et al.* Elastance of the Pleural Space: a predictor for the outcome of patients with malignant pleural effusion. Ann Intern Med 1997; 126: 768-774