A patient with life threatening bronchospasm....

DR K Pillai
DR BS Allyjan

Apollo BRAMWELL HOSPITAL

Medical Excellence

Mr Breethewell, 64 Yr old

•Ambulance pick-up on 24-10-2014: difficulty to breathe despite having been nebulised at home.

•Feeling of tight chest for 1week

• No other symptoms

•Physical exam revealed him to be tachypneic with diffuse expiratory wheeze

•GCS 15
•Other systemic examination were normal.
•Afebrile,Random blood glucose 9.6mmol/l
•BP 140/70 HR 106 Sinus tachycardia
•Spo2 2L NP oxygen=96%

VERY TIGHT CHEST

From the history:

- Breathing difficulty twice in past which necessitated a visit to the hospital

- 3 yrs ago in Australia
- Last year in Mauritius

- Both episodes were treated with nebulisations and stat medications and he NEVER ATTENDED FOLLOW UP

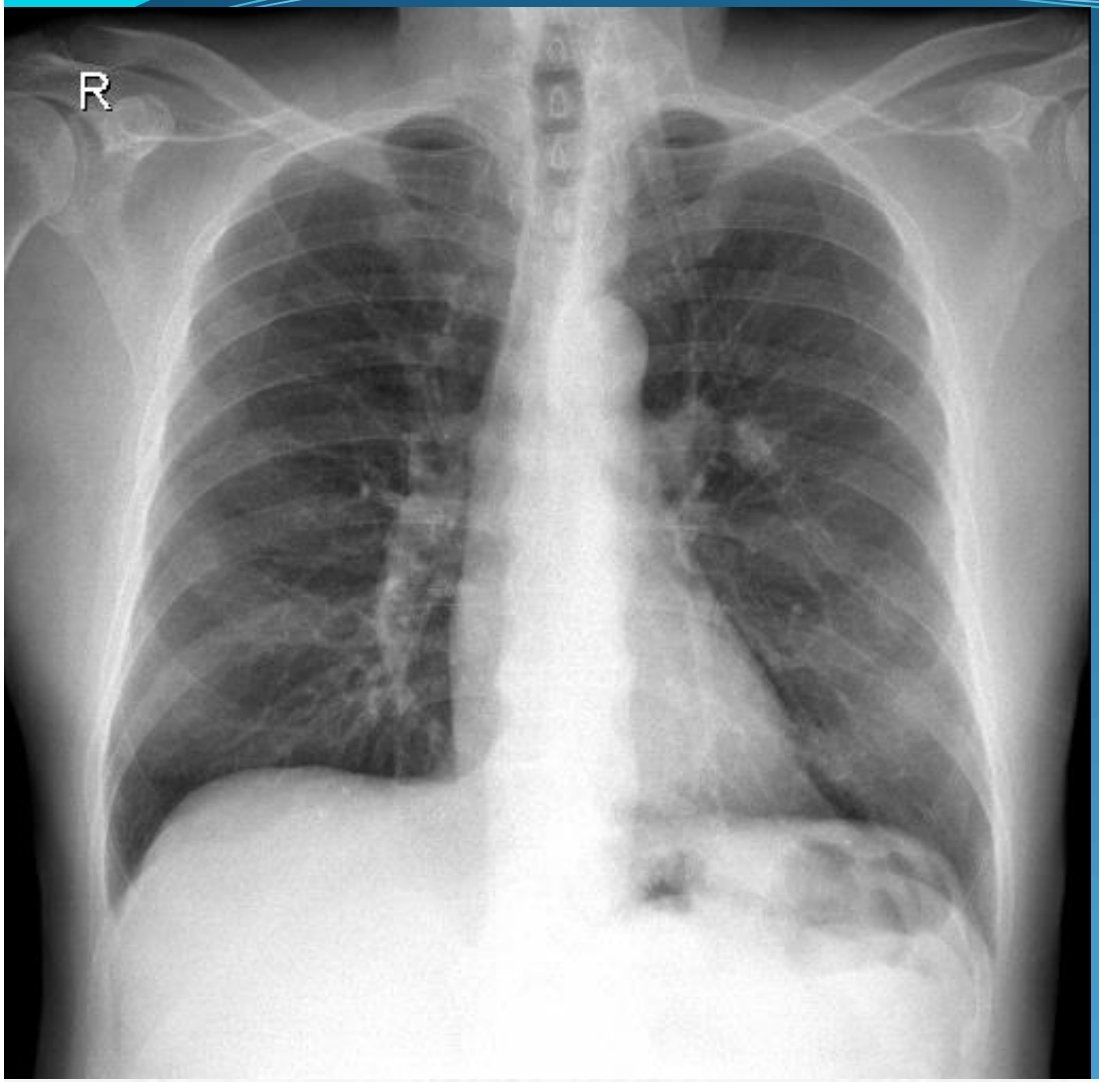
- Use of PRN MDI/ GP administered steroid courses last 1 month
- Diabetic on OHA
- Hypertensive on medications

- Neglected himself recently with heavy alcohol consumption
- Allegedly stopped smoking many years ago

Apollo BRAMWELL HOSPITAL

Medical Excellence

Initial investigations



CBC

Hb 13.1	EOS 0.1
MCV 96.4	BASO 0.5
TLC 7.56	MONO 7.1
Neu 85.4	LYMPH 6.7
PLT 514	

BIOCHEMISTRY

Urea 24.2
Creatinine 1.6
Na+ 135
K+ 4.8
Cl- 100
CRP 0.7
Unremarkable LFT

ABG(2L NP O2)

Ph 7.479
Pco2 36.3
Po2 68.3
HCO3 26.4

Apollo BRAMWELL HOSPITAL
Medical Excellence

- Ventolin alternate with Duolin nebulisations Q4H
- IV methylprednisolone 40mg Q6H
- STAT dose IV magnesium sulphate
- IV Aminophylline
- Other supportive treatment

Very tight chest
Hypertensive reaction
Worsening ABG parameters
(FM O2 4LPM :**7.358/48.1**/109/26.4)

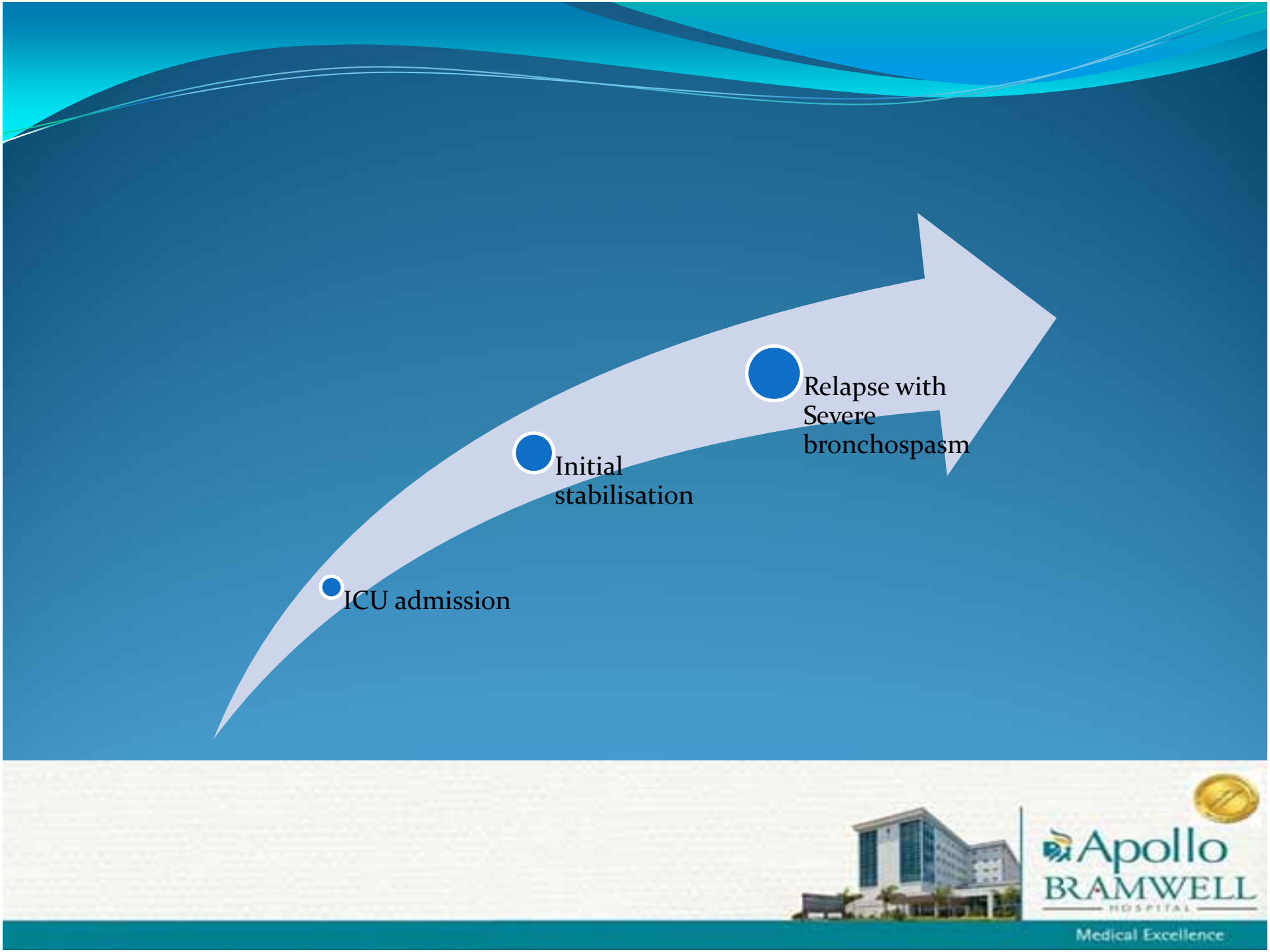
Non invasive ventilation
Continuous Nebulisations
Close ABG monitoring

Apollo BRAMWELL HOSPITAL
Medical Excellence

DAY 2 ICU

- Still very wheezy after >12 hour of NIV
- **EXHAUSTED**
- ABG (RA): **7.364/44.3/57.4/24.7**

Elective intubation
Iv salbutamol infusion(2.5mcg /minute)
Repeat Magnesium sulphate
Regular ABG
Labile BP: Requires IV medications for BP control


Relapse with Severe bronchospasm
Initial stabilisation
ICU admission
Apollo BRAMWELL HOSPITAL
Medical Excellence

DAY 3 ICU

10.00

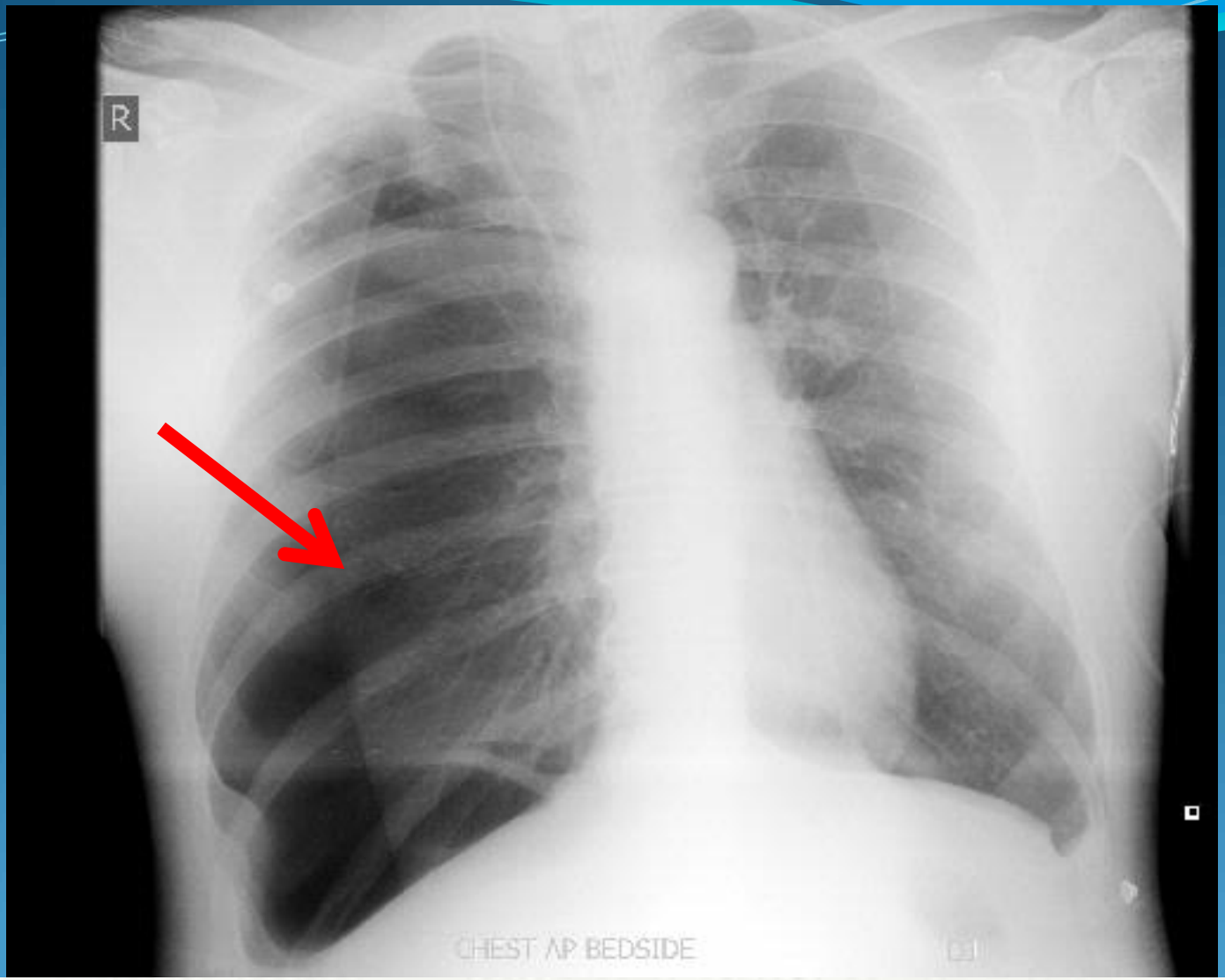
- Central line insertion
- RT IJV catheterisation under USG Guidance
- CXR post central line insertion

Apollo BRAMWELL HOSPITAL

Medical Excellence

DAY 3 ICU

10:00



?

DAY 3 ICU

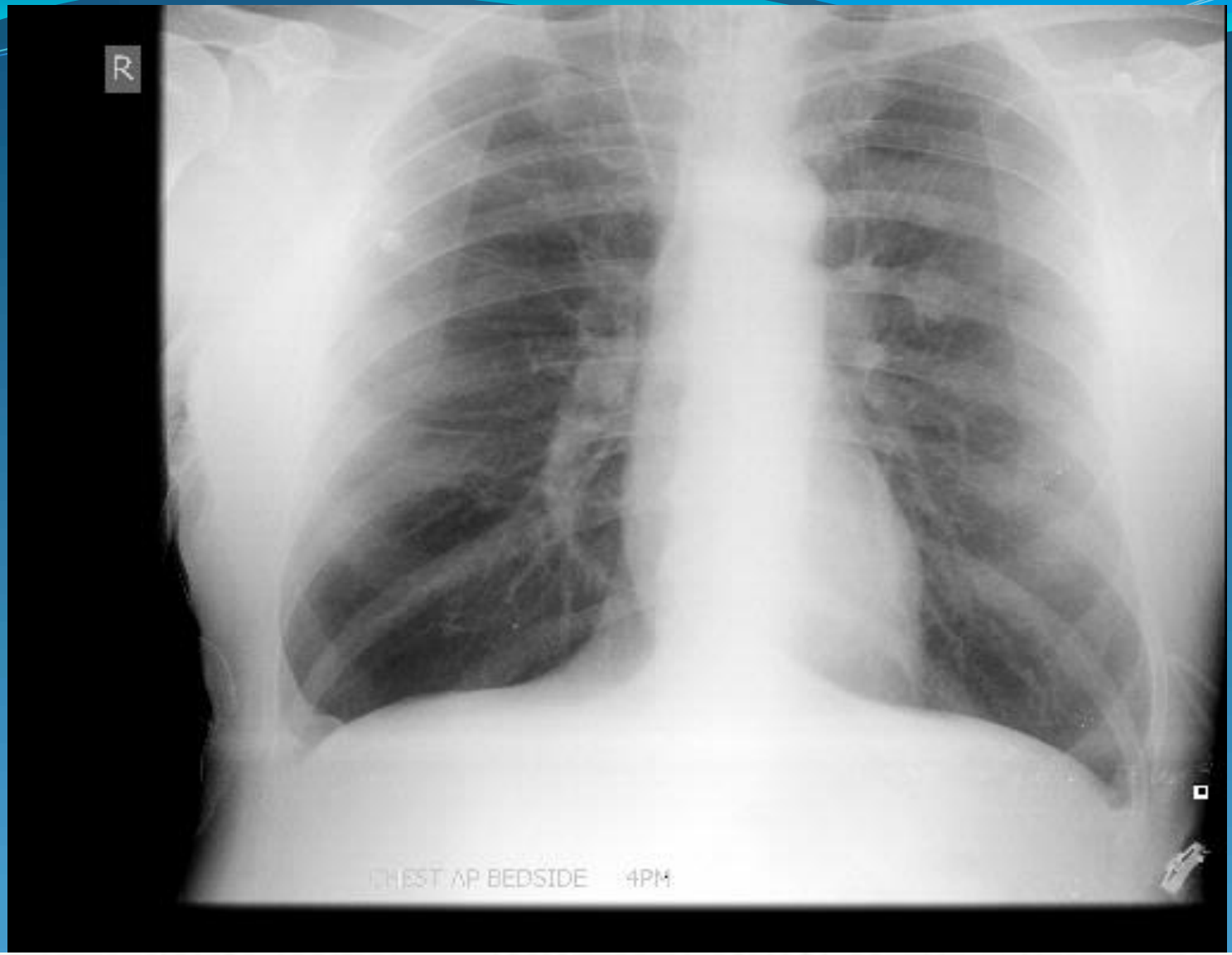
12.00

- RT Chest tube insertion:connected to underwater seal
- Total re-expansion of RT Lung
- Stable ventilatory /hemodynamic parameters

Apollo BRAMWELL HOSPITAL

Medical Excellence

Total Re-expansion post chest tube



DAY 3 ICU

2330

- Desaturation
- Not achieving adequate TV
- Suctionning airways:Purulent tracheal secretion
- Drop in BP
- Bradycardic
- Aggressive medical management

Apollo BRAMWELL HOSPITAL

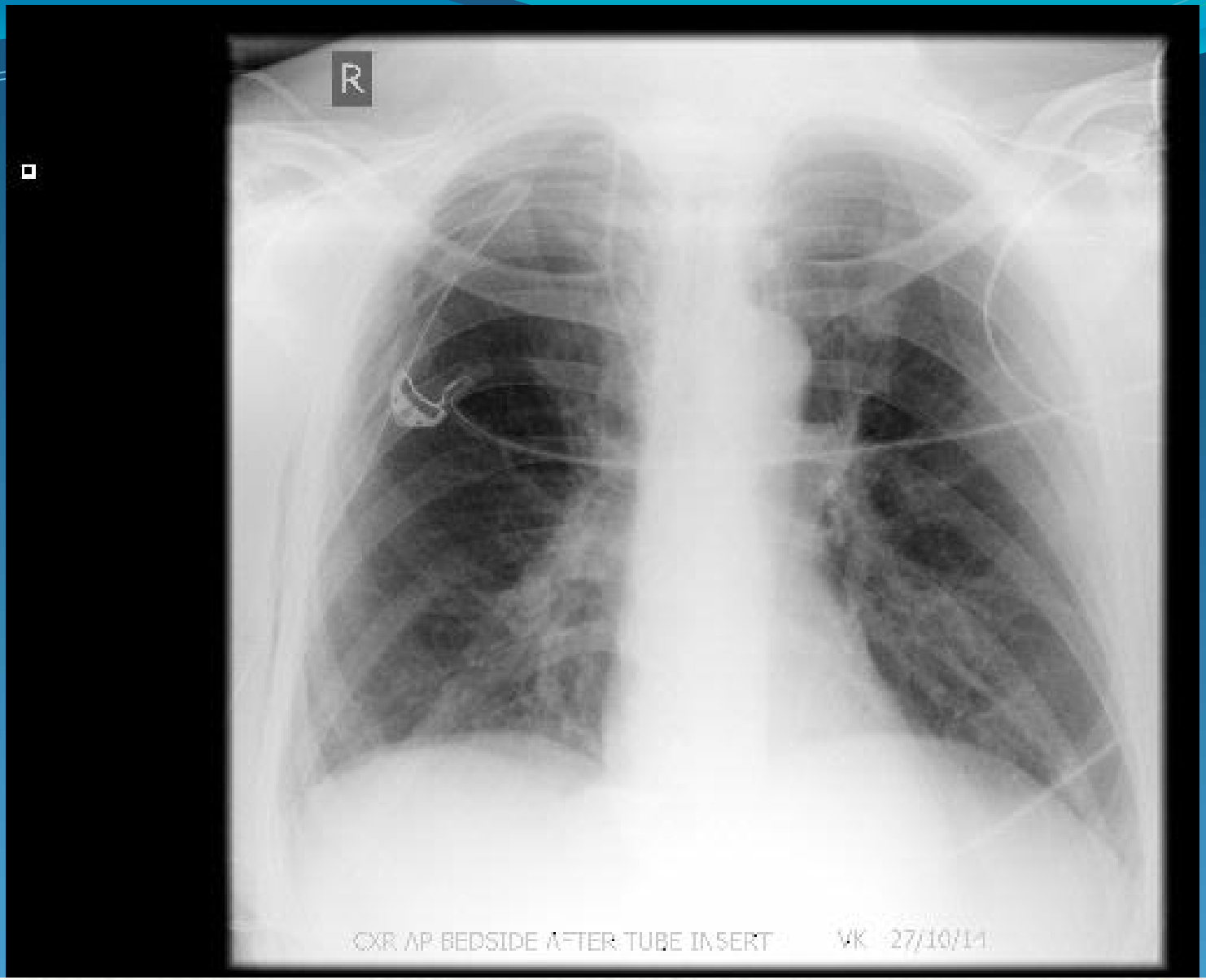
Medical Excellence

23:30

Unstable hemodynamics

DAY 4 ICU

00:00



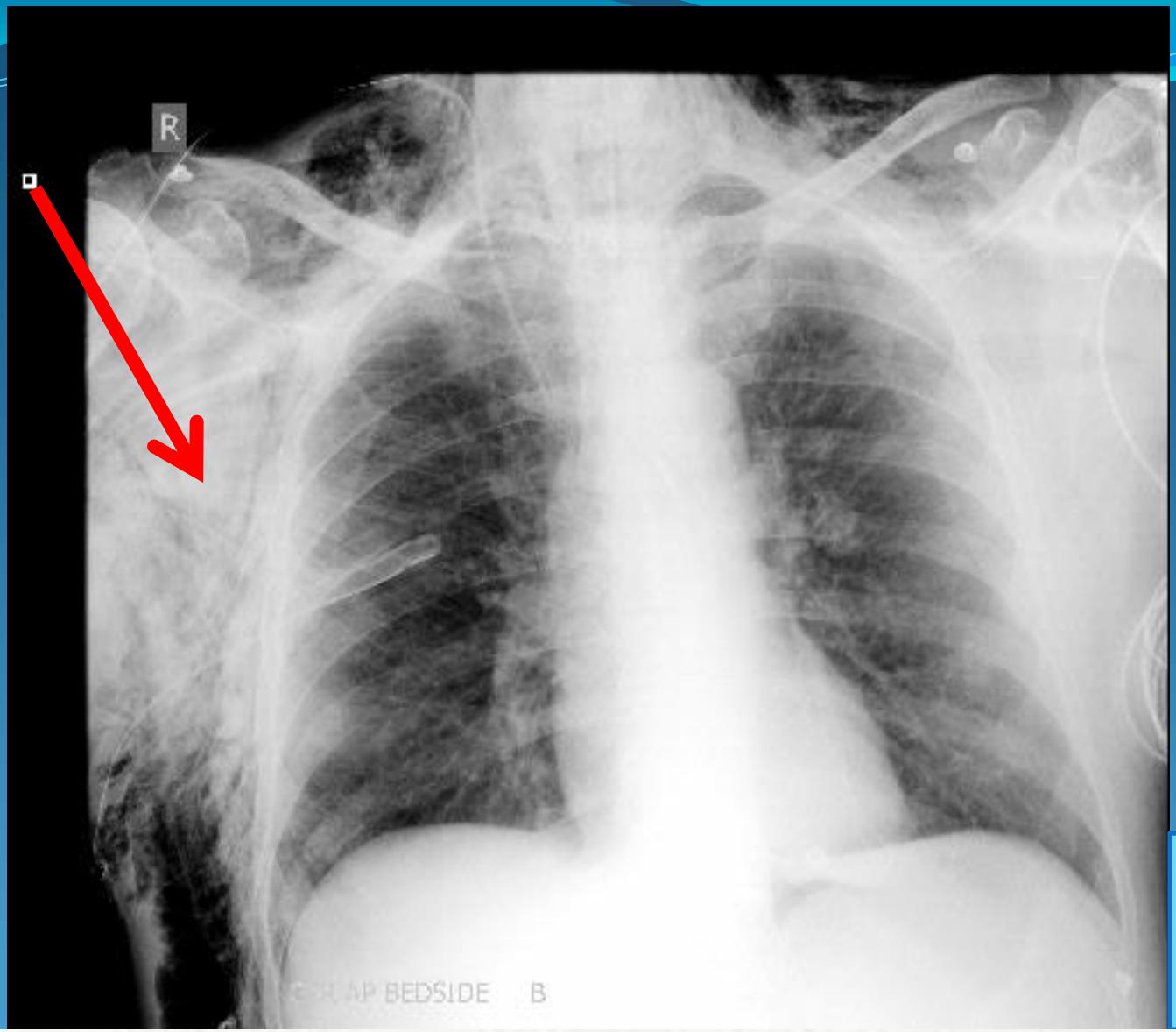
DAY 5 ICU

- Mechanical ventilation
- Purulent tracheal secretion
- IV Meropenem Day 2
- Aerobic Gram Negative m.organism …….likely resistant to Carbepenems/Tazobactam/colistin
- Sensitive to Ciprofloxacin!
- Started IV Ciprofloxacin

Apollo BRAMWELL HOSPITAL

Medical Excellence

DAY 5 ICU



?

DAY 6 ICU/DAY 5 Ventilator

- **SC emphysema not better: THINK D O P E ?**

- Underwater seal system changed to a more conventional single chamber system

- Still very tight chest

- Stepped down on ventilatory support but failed spontaneous breathing trial

WHAT NEXT?

Apollo BRAMWELL HOSPITAL
Medical Excellence

- Increased IV salbutamol to 5 micrograms/minute
- IV infusion Magnesium sulphate 1gram/hour for 12 hours
- TRACHEOSTOMY??

Apollo BRAMWELL HOSPITAL

Medical Excellence

DAY 7 ICU/DAY 6 Ventilator

- Less wheeze
- Successful spontaneous breathing trial
- Successful extubation
- IV magnesium sulphate 1gram/hour continued for another 12 hours
- With Mg2+ level monitoring/clinical monitoring of Mg2+ toxicity

Apollo BRAMWELL HOSPITAL

Medical Excellence

DAY 9 ICU

- Removal of central line
- IV ciprofloxacin 200mg Q12H

DAY 10 ICU

- Tracheal secretion isolate:

Heavy Growth Stenotrophomonas maltophilia sensitive only to ciprofloxacin **!**

DAY 11 ICU

- Chest tube removed

Apollo BRAMWELL HOSPITAL

Medical Excellence

DAY 12 ICU

- Last day IV ciprofloxacin (7-day course completed)
- Subsiding subcutaneous emphysema
- Bronchospasm under control
- Mobilising
- No invasive device
- Transfer to ward

Apollo BRAMWELL HOSPITAL

Medical Excellence

DAY 14 OF ADMISSION/ DAY 2 WARD

Fit for discharge

Discharge medications:

•Foracort (Formoterol Fumarate+ Budesonide) Inhaler 400 mcg twice daily (with spacer)

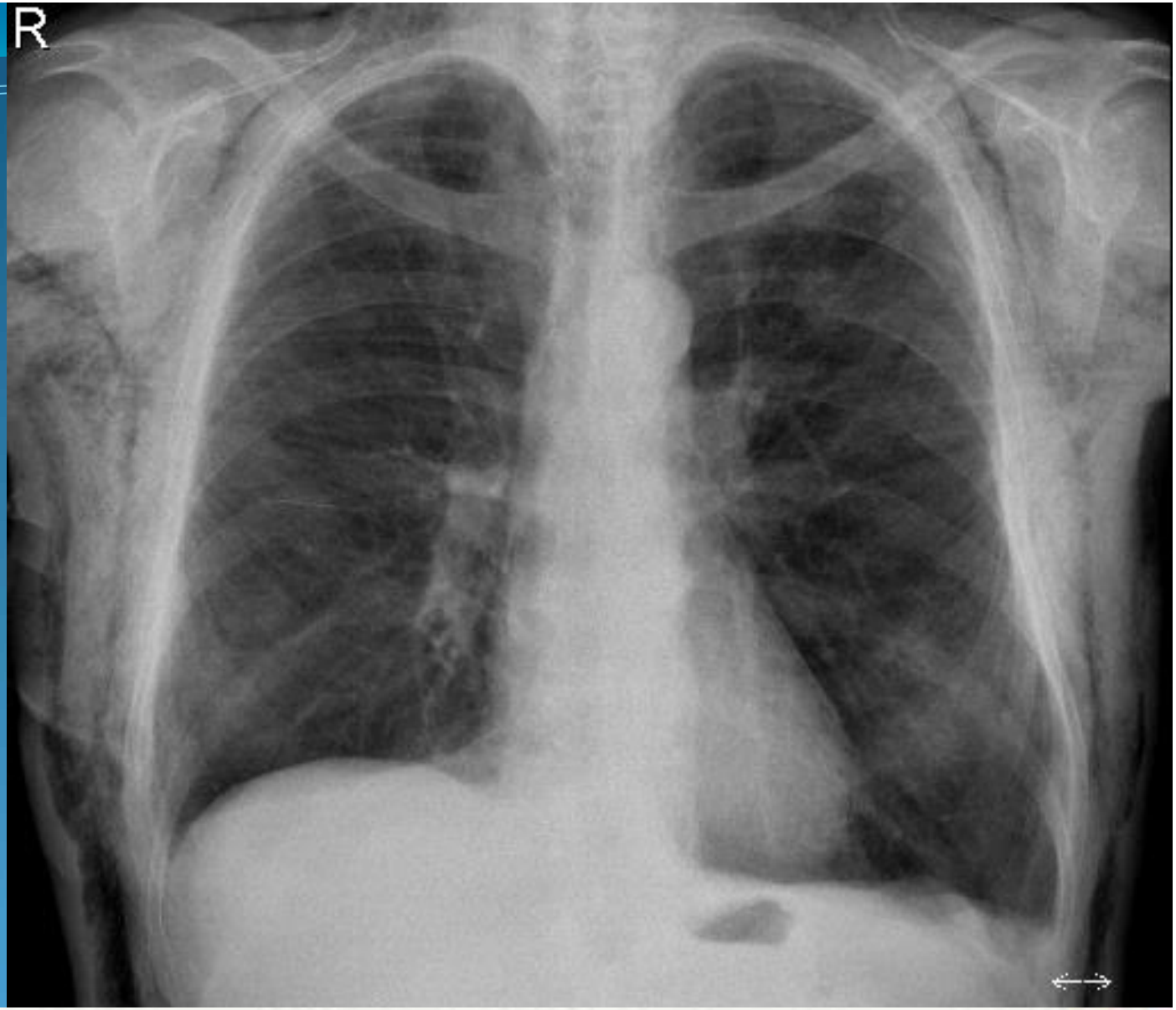
•Tab Montelukast
•Tab prednisolone
•Tab rabeprazole
•Tab theophylline
•Tab Bilastine(rhinitis)

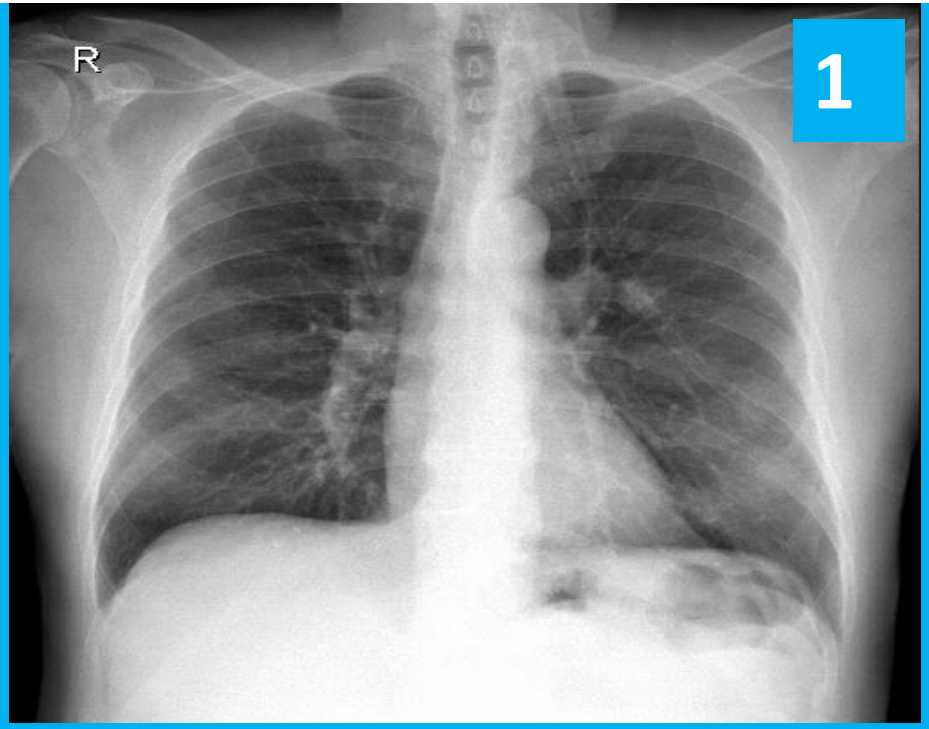
•Ventolin inhaler PRN if breathless
•Advised influenza and pneumococcal vaccination

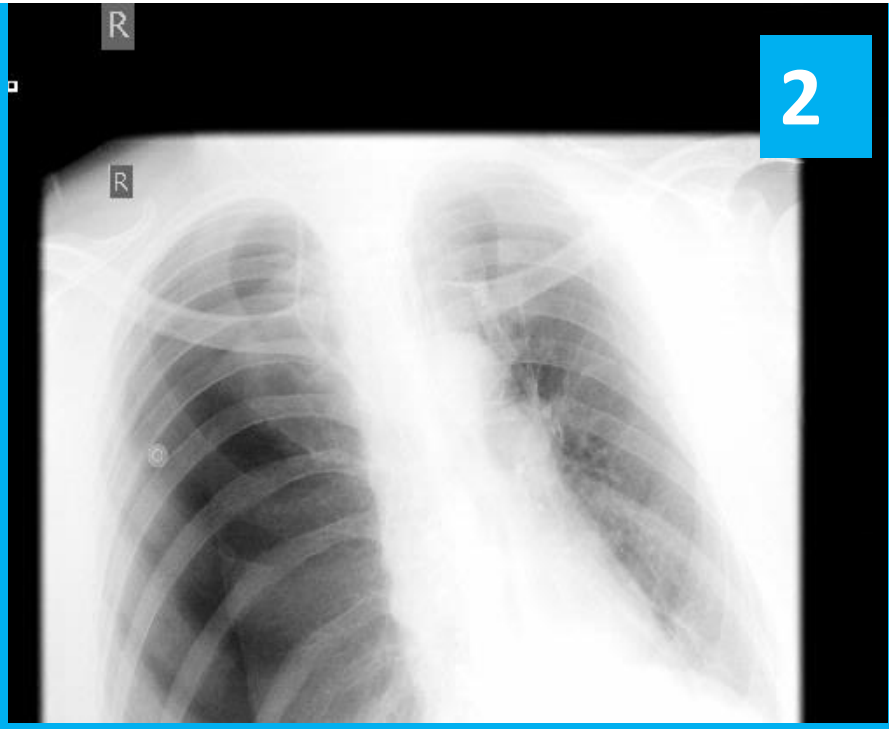
Apollo BRAMWELL HOSPITAL

Medical Excellence

04-11-2014
Chest Xray
Before discharge




R
1


R
R
2


R
3


4

or

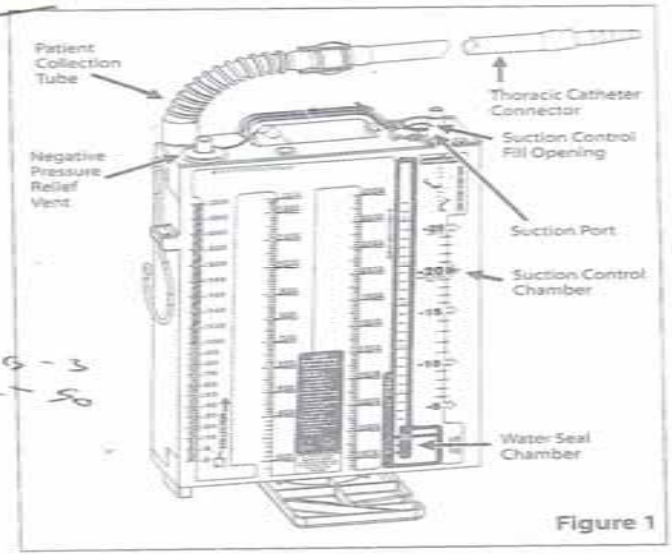


Figure 1

Instructions For Use

A. Description (Figure 1)
The Aqua-Seal™ Chest Drainage Unit (CDU) is a three chamber chest drainage unit incorporating a Water Seal, Suction Control, and Blood Collection Chamber. The compact, break-resistant, crystal clear vessel provides easy and accurate visualization of fluid within the CDU.
High negative pressure can be relieved through the operation of the manual negative pressure relief vent incorporated on top of the CDU. Prevention of positive pressure build-up is provided by an automatic relief valve also incorporated on top of the CDU.

B. Indications
The Aqua- Seal CDU is indicated for:
1. Evacuation and collection of fluid and/or air from the mediastinal and pleural cavity in post-operative and trauma situations.
2. Prevention of fluid and/or air re-accumulation in the mediastinal and pleural cavity.
3. Facilitation of complete lung re-expansion and restoration of normal breathing dynamics.

C. Aqua-Seal CDU Setup
1. Fill Water Seal Chamber (Figure 2).

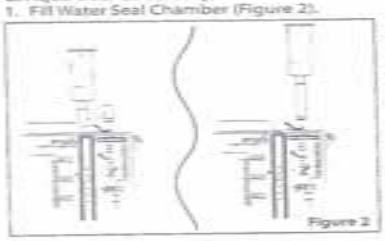


Figure 2

- Position preattached syringe as illustrated on syringe barrel.
- Fill syringe to top (approximately 45 mL of sterile fluid).
- Raise attached syringe above Aqua-Seal CDU allowing fluid to flow into Water Seal Chamber to the 2 cm line. Water color will change to blue, indicating correct filling of the Water Seal Chamber.
- Discard syringe and tubing from CDU.

Note: Water seal protection has now been established and the unit is now ready for gravity drainage. To adjust fluid in the Water Seal Chamber, utilize water seal access port located behind Water Seal Chamber (See section F, #7)

2. Fill Suction Control Chamber (Figure 3).

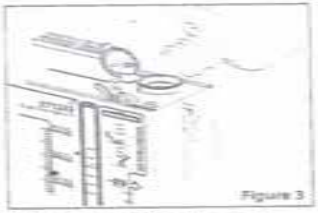


Figure 3

- Fill Suction Control Chamber to prescri vacuum level by pouring sterile fluid directly into white Suction Control Chamber opening.
- Close Suction Control Chamber using tethered cap. Make sure cap "snaps" tigh into place.

Note: In order to achieve suction level greater than 25 cm H_2O, bypass of the Suction Control Chamber is necessary. Suction should be regulated with a tho wall regulator or portable suction pum (See section F, #6)

D. Aqua-Seal CDU Operation
1. Remove protective cover from patient connector and connect to patient's thoracic catheter. Tape to secure.
   Note: For improved flow, connector may be cropped to match catheter si
2. Turn black valve on suction port to "close" position (clockwise rotation). A to regulated suction source.
3. Turn vacuum on. Open black valve (counter-clockwise) until gentle bubbl appears in the Suction Control Chamber (Figure 4).

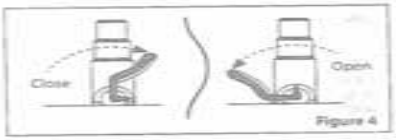


Figure 4

4. Position Aqua-Seal CDU as far below level of patient as possible to facilitate drainage.
   - If CDU is placed on floor, rotate footstand 90 degrees, for added stability
   - If CDU is hung on bedside, do not rotate footstand. Unit should be hung far below level of patient as possible.

   Note: Ensure patient drainage tube is straight and dependent loops do not form.

E. Assessment and Management Chart
This chart provides guidelines for assessment and management of chest drainage with the Aqua-Seal Chest Drainage Unit (8888-571299).

Water Seal Chamber		Assessment and Management of Air Leak
Tidaling*	Bubbling**	
Yes	Yes	Indicates patient air leak exists and lungs are not reexpanded. The greater the degree of bubbling and tidaling, the greater the extent of air leak (pneumothorax) and the greater the degree of lung collapse.
No	No	Indicates resolution of air leak and lung reexpansion (slight tidaling may be seen). Be sure patient collection tube is not kinked or obstructed; verify lung reexpansion.
No	Yes	Indicates a possible connection or system air leak. Momentarily pinch off the thoracic catheter. If bubbling continues, a connection leak exists. Secure and tape all connections.
Yes	No	Can be observed with partial or total pneumonectomy and disease states associated with decreased lung compliance (stiff lungs).

Important: When using this CDU, please note the following:
1. Check all connections to be certain the system is airtight.
2. Be sure fluid in Water Seal Chamber is maintained to fill line at all times.
3. The amount of suction is determined by the level of water in the Suctio Control Chamber. This level should be established by order of a physici

* Tidaling: The rise and fall of fluid in the Water Seal Chamber, which is a di reflection of the degree of lung re-expansion. Tidaling decreases as the lur re-expands.
** Bubbling: Bubbles flowing from left to right.

F. Cautions and Warnings
These units are intended for use only by persons trained in the appropriate Medical Techniques. These components are designed to be compatible with Thoracic catheters. Compatibility of this product with oth Thoracic catheters needs to be established by the user.
When using the Aqua-Seal CDU, please note the following:

Take Home Messages

1. Need to individualise care – guidelines/protocols may not be an end in themselves

2. Risk of pneumothorax even in Internal Jugular line catheterisation

3. Know your chest tube/under-water seal system well

4. Stenotrophomonas maltophilia : a dangerous pathogen

5. COPD v/s Asthma: 1. Specific ventilator settings
   2.differentiation can be v.difficult in acute catastrophic settings

6. Make sure the patient who is precribed an inhaler device/spacer is taught how to use it

Apollo BRAMWELL HOSPITAL
Medical Excellence

Apollo BRAMWELL HOSPITAL

Medical Excellence