Bronchopleural fistula

Causes
- Iatrogenic -> volutrauma, airway injury, CVC insertion, ICC insertion, pleural biopsy
- Bleb - asthma, COPD
- Infection - pneumonia, esp staphylococcal, TB
- Trauma
- ARDS with PPV
- Radiotherapy

Complications
Rarely results in significant physiological derangement unless large
- Atelectasis
- Pleural space infection
- Loss of PEEP
- V/Q mismatch (rare)
- Delayed liberation from ventilation

Diagnosis
- Persistent bubbling in the ICC drain for more than 24 hrs (inspiratory bubbling only => small, inspiratory + expiratory bubbling => moderate, Inspiratory Vt » expiratory Vt => large)
- Sudden drop of effusion to a level post pneumonectomy on CXR => new BPF
- HRCT thorax - 90% sensitivity
- Methylene blue instillation via ETT
- Fibreoptic bronchoscopy, especially pneumonectomy stump

Treatment
1) Treat underlying lung pathology - additional measures are often unsuccessful until underlying pathology resolved

2) Minimise transpleural gradient
- Keep mean airway pressure to minimum
- Low Vt: 6-7ml/kg
- Low $f$
- Low PEEP, including iPEEP
- Minimum negative ICC suction necessary to maintain inflated lung
- Regular bronchodilators
- Keep ETT clear of secretions
- Wean off PPV as soon as practical
- Positioning may help
- Antibiotics may be required
- Nutritional support is important
- High frequency ventilation may help if V/Q mismatch is significant

3) Specific BPF therapies
Usually only required for large, non-resolving, physiologically significant BPFs
- Independent lung ventilation
- Selective bronchus balloon occlusion
- Bronchial plug - gelfoam, autologous clot
- ND-YAG sclerotherapy
- VATS

While supportive and specific therapies may reduce the BPF leak, no therapy has a proven benefit on patient outcome

References
-UpToDate.com 2009