Medical Thoracoscopy
Surgical referral

- Biopsies and treatment
- Decortication of empyema
- VATS (video assisted thorascopic surgery)
Management

- Treat the cause
  - Initial and medium/long term
    - ABCDE
    - Treat sepsis ................
Remove fluid

- Especially if complex infected or symptomatic from the fluid

- Options are then
  - Drain to dryness (infection or in cancer if desire to pleurodese)
  - Remove 1-2 litres to improve symptoms and monitor
Thoracentesis catheter
Seldinger intercostal drain
Surgical ‘large bore’ chest drain
Malignant effusion

• By definition metastatic
• 90% will recur after drainage
• Option for definitive treatment
  • Medical Pleurodesis – 60% successful
  • Indwelling pleural catheter
  • Surgical pleurodesis
Indwelling Pleural Catheter
Indwelling Pleural Catheter
Empyema

- Drain and antibiotics
- Intrapleural thrombolytics (MIST 2) - Alteplase and Dornase alpha BD for 3 days
- Surgical decortication (VATS or Thoracotomy)
Surgical pleurodesis
Haemothorax

- Evacuate and refer
Chylothorax

- Low fat diet with medium chain fatty acids
- Octreotide
- TD ligation by VATS or other surgical approach
Hepatic Hydrothorax

- Diuretics and fluid/electrolyte balance best
- Draining the fluid can lead to massive protein loss and haemodynamic destabilisation
- If palliative – IPC might be inserted
- CPAP has a role
- CLOTTING!!!!
Summary for Effusion management

- CxR
- US tap
- Analyse
- If not clear do a CT
- Might need a biopsy
  - Medical Thoracoscopy, surgical VATS or CT guided
- Treat cause
- Consider pleurodesis or IPC if chronic.
The management of Pleural effusions from Clinic or Ambulatory Care

Pleural effusion on Chest X ray

Unilateral

Outpatient Pathway Criteria met?

YES

Refer to Respiratory Team Inpatient Referral (via letter at present)

NO

Refer to Respiratory Team Inpatient Referral

Bilateral

If inpatient pleural procedure needed - refer

In-patient pleural procedure refer to RESPIRATORY MEDICINE INPATIENT

Not suitable for outpatient management by Respiratory Dept.

Normally not indicated

O/P Pleural Pathway Criteria

- FBC and INR available
- Pulse <100
- RR <25
- Sats > 93% on RA
- Systolic BP >100
- Effusion – unilateral
- CRP <100
- CURB 65 <3
- No acute OT/PT concerns
- App with 72 h for infection
- or 2 weeks for other dx

Respiratory Secretaries will arrange and fix time slot and produce list
Common questions on drains

- How quickly can fluid be drained?
  - 1.5 litres (or less if coughing) and then close for 4 hours
    - Cough
    - Bleeding
    - Oedema – rare and responds well to CPAP

- Follow up - 6 weeks post drain removal

- Flight – 1 week after demonstrated complete resolution
Talc or Doxy for Pleurodesis

- Talc- more effective, but risk of ARDS approx 1%
- Doxy safer, but less effective
Pleurodesis or IPC

- Not clear- patient choice
- IPC is a pragmatic solution (and may also cause pleurodesis)
Mesothelioma

- A neoplasm of the mesothelial surface of the pleural (also peritoneum, pericardium)
- Strong causative link with Asbestos exposure
  - Also Simian Virus 40 exposure
  - Radiation therapy
  - Carbon nanotubes used in nano-electronics.
Mesothelioma

- Crocidolite (blue, short, straight) most carcinogenic (or just best penetrating)
- Long latency between exposure and disease development
Epidemiology

• UK- 2,500 new cases per year
• Incidence likely to peak in the next few years and then start declining
• It is felt that there is a baseline rate (and we will probably reach that in about 2040-2050)
Mesothelioma (C45): 1979-2013
European Age-Standardised Incidence Rates per 100,000 Population, by Sex, Great Britain

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Mesothelioma

- Diagnosis by biopsy/ tissue
  - Histology
  - Biomarkers - SMRP (soluble mesothelin related peptides)
  - Osteopontin not so specific
  - Calretin, Keratin, WT1 protein
Mesothelioma

- Staging by TMN into I, Ia and b, II, III and IV
- Median survival 12 months
- Chemotherapy at present only clear treatment with good evidence base (Cisplatin plus Pemetrexed). Extends survival by up to another 12 months.
- New therapies coming through (immunotherapy, new chemo etc)
- Focal radiotherapy only needed if larger drain.
- Medical pleurodesis or IPC
Asbestos and the lung

- Benign pleural plaques
  - No need to FU
- Diffuse pleural thickening
- Mesothelioma
- Asbestosis
- Associated with increased risk of cancer (especially with smoking)
Asbestos and compensation

• 3 years from being told of a compensable diagnosis to initiate a claim
  • Make sure you raise this and document it (to avoid any claims for losses against you!)

• Mesothelioma, Asbestosis and Diffuse Pleural thickening can be considered for compensation
PNEUMOTHORAX
Definition

- Air in the pleural space
  - Spontaneous
    - Primary
    - Secondary
  - Traumatic
  - Iatrogenic
Pathophysiology

- Rupture of subpleural blebs, bullae or weaknesses in the lung parenchyma.
- Early Emphemsematous like changes are seen in most patients if looked for, even in young non smokers (so the term primary might well be spurious)
- Young smokers often have small subpleural cysts seen on CT
- Fluorescein enhanced auto fluorescence thoracoscopy has demonstrated increased visceral pleural porosity in patients with apparent primary pneumothoraces.
Fluorescein enhanced auto-fluorescence thoracoscopy
Early emphysematous changes

Subpleural bulla
Spontaneous Pneumothorax

Primary
• Under 50
• < 20 pack year history of smoking
• No underlying lung disease

Secondary
• Smoker > 20 pyh
• COPD
• Cancer
• Bronchiectasis
• Catemenial (endometriosis)
• ILD
• Any lung condition at all
Causes to remember of exams

- Cystic lung disease
  - Cystic Fibrosis
  - Pulmonary Langerhans Cell Histiocytosis
  - Lymphangioleiomyomatosis (proliferation in the lymphatics)
Epidemiology

• Spontaneous Pneumothorax
  • Primary
    • 12/ 100,000 population/year (men) 2/ 100,000 population/year (women)
  • Secondary
    • 6/100,000/year (men) 2/100,000 / year (women)
    • Risk in heavy smokers >100 fold

• Risk X 7 5-10 cigarettes per day, X 21 10-20 and X 100 in heavy smokers
Clinical features

- Pain
- SOB
- Tightness
- Examination findings nil if mild
- Might find
  - Reduced BS
  - Mediastinal shift
  - Hyper-resonant
Diagnosis

- Chest X-ray
  - Normal PA full inspiration film
  - Expiratory films no more sensitive
- CT scanning (Gold standard)
  - % ptx as $100 - (100 \times \frac{\text{diameter of deflated lung}^3}{\text{diameter of hemithorax}^3})$
  - More common to estimate on CxR - $>2\text{cm at hilum} = >50\%$ collapse
**ACCP Guideline**

Apex-to-cupola distance
- <3 cm = small
- ≥3 cm = large

**BTS Guideline**

Distance at level of hilum
- ≤2 cm = small
- >2 cm = large
Simple Pneumothorax
Pneumothorax

Tension

[Image of an X-ray of a chest with a hint of lung collapse suggesting a tension pneumothorax.]
Beware Big Bulla
Management options

- Observe
- Aspirate air
- Venflon 2\textsuperscript{nd} ic space mid clavicular line (tension ptx)
- Ambulatory pleural vent
- Chest drain + / - suction
- Surgery
Pneumothorax management

Hemodynamic or significant respiratory compromise suggesting tension pneumothorax?

Yes

Immediate needle decompression followed by chest tube insertion

No

Primary pneumothorax

- Depth <2 cm

- >2 cm depth and/or breathless?

- Aspirate with 16-16G cannula

- Residual depth <2 cm with symptomatic improvement?

- Usually discharge with follow-up in 2-4 weeks

- Chest tube insertion (8-14F)

- Admit

- Heimlich valve may have a role

Secondary pneumothorax

- Suggested by:
  - Known lung disease
  - Evidence or chest x-ray
  - Age >50 with significant smoking history

- Depth <1 cm

- Admit

- High-flow oxygen (unless contraindicated)

- Observe 24 hours

- Chest tube insertion (8-14F)

- Admit

- Heimlich valve may have a role

- Depth 1-2 cm

- Aspirate with 5-18G cannula

- Residual depth <1 cm?

- Admit

- Observe 24 hours

- Heimlich valve may have a role

- Depth >2 cm

- Aspirate with 5-18G cannula

- Residual depth >2 cm

- Admit

- Observe 24 hours

- Heimlich valve may have a role
Risk of recurrence

• Primary Ptx
  • 40% 5 year risk of recurrence
  • Avoid scuba diving
  • Higher in smokers
  • Surgical procedure if high risk pass times or occupation
  • If EELC on CT - ? Surgery???? → RAMPP trial secondary outcome
Risk of recurrence

- Secondary Ptx
  - Risk v high
  - Advise a definitive procedure
    - Medical pleurodesis
    - VATS and surgical pleurodesis
When can I fly?

• 1-2 weeks after documented resolution
Ambulatory management - pleural vent
Pleural vent
Pleural vent
Getting signed off for pleural procedures
All procedures

- At least 5 procedures performed or observed in simulation
- 2 DOPS signing off competence
For procedures with effusions

- Need US sign off
  - 20 – observations
  - 20 - normal chest scans
  - 20 – abnormal chest scans
  - 20 procedures performed under direct US guidance
  - Thoracic US course

- KEEP A LOG BOOK!
OKAY, THAT'S PRETTY MUCH IT!
WHAT DO YOU THINK?

ZZZZZZZZZ!