# Respiratory Medicine for Lawyers

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## What I want to cover

- Function of the respiratory system
- Anatomy & Physiology
- Common diseases

## What does the respiratory system do?

- Provides $O_2$ needed for metabolism
- Gets rid of waste gas ($CO_2$)

## How does the respiratory system do this?

- Control Mechanism
- Ventilatory Pump
- Gas Exchanger

## Clinical Problems

- Asthma
- Pneumonia
- Pneumothorax
- PE (pulmonary embolism)
- TB (tuberculosis)
- Lung cancer

## ASTHMA

## What is Asthma?

- Episodic reversible airway obstruction
- Wheeze, cough, SOB, chest tightness
- No diagnostic test – a 'clinical' diagnosis
- Serial PEFR ≥ 20% day to day variability
- ⇧ FEV1 by ≥ 200 ml (15%) with BD/steroids

## Severity of Asthma & PEFR

| | |
|---|---|
| • MODERATE | 50-75% predicted |
| • SEVERE | 33-50% predicted |
| • LIFE THREATENING | <33% predicted |
| • NEAR FATAL | ⇧ $PaCO_2$<br>Mechanical ventilation |

## Treatment of Asthma

Bronchodilators
- SABA
- LABA
- Anticholinergics
- Theophylline

Corticosteroids
- Inhaled
- Oral

## Discharge from acute asthma

- Reduced Rx
- Off nebs ≥ 24 hours
- PEFR ≥ 75% predicted
- Minimal (preferably <20%) PEFR variation
- Self management plan
- Inhaler technique

## PNEUMONIA

## What is pneumonia?

- Infection of lung tissue
- Usually bacterial (hence early antibiotics)
- Cough / SOB / pain / fever / sweats

## Pneumonia Severity – CURB-65

| | |
|---|---|
| Confusion | MTS ≤ 8 |
| Urea | > 7mmol/l (dehydrated) |
| Resp rate | ≥ 30/min (normal ~15/min) |
| BP | SBP < 90, DBP ≤ 60 |
| 65 | Age ≥ 65 years |

## Pneumonia Severity – CURB-65

| CURB-65 score | Severity | Risk of Death | Hospital Rx |
|---|---|---|---|
| 0-1 | Low | < 3% | Maybe |
| 2 | Moderate | 9% | Definitely |
| 3-5 | High | 15-40% | Definitely |

## Pneumonia Treatment

- Antibiotics within 4 hours
- Oxygen
- IV fluids
- Rx any coexistent disease e.g. COPD

## Medicolegal issues

- Wrong diagnosis e.g. PE
- Wrong antibiotics – recognise if not improving
- No oxygen/IV fluids (if required)
- Inappropriate follow up

## Why follow up the patient?

- To ensure not missed underlying lung Ca
- 6 weeks ± CXR

CXR if:

- Persistent symptoms or physical signs
- Age > 50 years
- Smoker

## PNEUMOTHORAX

## What is a pneumothorax?

- Air trapped in pleural space
- Air at higher pressure than lung
- Lung collapses
- SOB, chest pain
- 1° or 2°
- Spont *vs* traumatic
- Small *vs* large

## Treatment of pneumothorax

- $O_2$
- Observation
- Aspiration
- Chest drain
- ± suction
- ± surgery

## Pneumothorax-Medicolegal Aspects

- Missed diagnosis
- Premature discharge e.g. 2° pntx
- Drain insertion - ? Safe triangle used
- Appropriate drain Mx – position, swinging, bubbling, CXR
- Premature suction - ? Unilateral pulm oedema
- Failure to refer for surgery
- Discharge advice – flying, SCUBA

# PULMONARY EMBOLISM (PE)

## PE

- Blood clot in pulmonary circulation
- Cuts off blood supply hence less $O_2$
- SOB, chest pain, tachycardia, haemoptysis

## PE

- Diagnosis easily missed if not considered
- Pretest probability – Wells' score (likely v unlikely)
- VQ scan or CTPA
- Rx – heparin, warfarin, thrombolysis

## PE – Medicolegal Aspects

- Failure to consider – isolated SOB or ⇧ HR
- Inadequate Rx
  - stopping heparin before INR ≥ 2
  - <6/12 Rx
- Wrong Ix – e.g. VQ scan in asthmatic
- DVT prophylaxis used?
- Inadequate warning Re: anticoagulation
  - monitoring, bleeding, interactions, procedures

## TUBERCULOSIS (TB)

## TB

- *Mycobacterium tuberculosis*
- Not always infectious
- Smear positive (AFB)
- At risk groups
  - immunosuppressed
  - heavy exposure

## TB - symptoms

Constitutional

- Fever, sweats, ↓weight , ↓appetite, malaise

Organ specific

- Lung – cough/SOB/chest pain/haemoptysis
- CNS – TBM – 3 stages acc to conscious level & focal neurology
- LN – cold abscess i.e. not hot/red/painful
- Bone – spinal cord compression

## TB - diagnosis

- Demonstration of AFB
- Positive culture
- May be a clinical diagnosis if suggestive hx in high risk pt

## TB - treatment

- 6 months for all except CNS TB (12/12)
- 4 anti-TB drugs for 1st 2/12
- 2 anti-TB drugs for 2nd 4/12 (10/12 for CNS TB)
- ± steroids – esp if CNS TB

## TB – Medicolegal aspects

- Delay in starting anti-TB Rx
- Incorrect Rx regimen (BTS guidelines)
- Spinal cord compression
- Drug toxicity (liver, eyes, neuro)
- Drug interactions (e.g. warfarin, OCP)

# LUNG CANCER

## Lung Cancer

~ 35,000 deaths pa in UK

80% dead within 1 year

5YSR ~ 6-7%

Major risk is smoking

## Lung Cancer

- Cough, haemoptysis, SOB, chest pain, weight loss, anorexia, hoarse voice
- NSCLC *vs* SCLC
- NSCLC 4 stages
- SCLC 2 stages

## Small Cell Lung Cancer (SCLC)

- Bad news
- LIMITED vs EXTENSIVE
- Limited – confined to one hemithorax
- Extensive – everything else

## Survival - SCLC

| No Rx | Rx with chemo/RT |
|---|---|
| 6/52 extensive | 12/12 extensive |
| 12/52 limited | 20/12 limited |

## Non-Small Cell Lung Cancer (NSCLC)

Stage 1-4 acc to:

- size of tumour (T)
- LN involvement (N)
- metastases (M)

## 1YSR for NSCLC

| | |
|---|---|
| Stage I | > 80% |
| Stage II | > 60% |
| Stage III | > 40% |
| Stage IV | < 20% |
| Unknown | > 20% |

http://about-cancer.cancerresearchuk.org/about-cancer/lung-cancer/survival

## 5YSR for NSCLC

| | |
|---|---|
| Stage I | 35% |
| Stage II | 20% |
| Stage III | 6% |
| Stage IV | 0% |
| Unknown | ~ 6% |

http://about-cancer.cancerresearchuk.org/about-cancer/lung-cancer/survival

## Lung Ca – Medicolegal Aspects

- Delayed diagnosis – worse stage (worse survival)
- Any cough > 3/52 needs CXR

## THANK YOU