Managing TB in Health care settings

- TB facts & figures
- Microbiology of TB
- Transmission of TB
- Infection control in health care settings
- Special cases - Resistant TB
- Masks
There’s a patient with TB on the ward...

Tuberculosis: What is it?

- TB is an infectious disease caused by Mycobacterium Tuberculosis.
- TB can only be spread by someone who is sick with Pulmonary TB.
- TB is hard to ‘catch’ = need long exposure and close contact.
- TB can affect any part of the body, and is transported around the body via the blood or lymphatic system. This is referred to as Non pulmonary TB.
- Even if infected by the bacillus, individuals may not go on to develop TB disease.
These would have to be present for more than 3 weeks

TB disease (pulmonary & extra pulmonary) can display different symptoms, but some common to both are:

- Fever
- Night sweats
- Weight loss
- Fatigue
- Loss of appetite
- Swollen lymph glands

Those with pulmonary TB disease may experience:

- Persistent Dry and/or productive cough
- Shortness of breath
- Haemoptysis
- Chest pain

These symptoms are more often than not, non-specific and mild, leading to misdiagnosis.
TB: The Figures

- Globally: heaviest burden is in the developing world = Indian sub-continent, former USSR states, South East Asia & Sub-Saharan Africa.

- UK: classed as a low risk TB country, but some parts of the UK have rates higher than in China and parts of Africa – London & Birmingham

- Scotland: TB rates have been stable and are declining since 2010

Microbiology

- Slow growing
- Gram positive
- Unique properties:
  - Rod-shaped
  - Thick waxy cell wall
- Acid/Alcohol fast bacillus (AAFB):
  - Smear positive = bacilli seen in a sample
  - Smear negative = bacilli not seen
A person may contract pulmonary tuberculosis from inhaling droplets from a cough or sneeze by an infected person.

Granuloma in lung tissue
Transmission of *M. tuberculosis*

- Spread by droplet nuclei
- Expelled when a person with infectious TB coughs, sneezes, speaks or sings
- Close contacts = highest risk of becoming infected
- Transmission only occurs in cases with Active and infectious TB
- Those with Latent TB cannot spread TB

Probability TB Will Be Transmitted

- **Infectiousness of person with TB**: Abnormal CXR? Dry Cough? Are they producing sputum? Do they have Haemoptysis?
- **Environment in which exposure has occurred**: Household? School/University? Work?
- **Duration of exposure**: Minimal vs. Prolonged contact
- **Virulence of the organism**
70% of contacts are not infected
30% of close contacts are infected and develop a positive PPD test
Person to person transmission is airborne

5-10% of infected individuals will develop disease within 1-2 years

90-95% develop latent infection
90-95% never develop disease
5-10% develop active tuberculosis
80-90% have pulmonary tuberculosis
10-20% develop non-infectious extra-pulmonary disease

**Conditions that increase risk of TB**
- HIV infection
- Substance abuse
- Recent infection
- CXR findings suggestive of prior TB
- Diabetes mellitus
- Silicosis
- Prolonged corticosteroid therapy
- Other immunosuppressive therapy
- Head and Neck cancer
- Hematological and reticuloendothelial diseases
- End-stage renal disease
- Intestinal bypass or gastrectomy
- Chronic malabsorption syndromes
- Low body weight (10% or more below the ideal)
Infection Control in Health Care Settings

Infection Control Measures

1. Administrative controls to reduce risk of exposure

2. Engineering controls to prevent spread and reduce concentration of droplet nuclei

3. Personal respiratory protection in areas where increased risk of exposure
1. Administrative Controls

- Reduce risk of exposing uninfected persons to infectious disease
  Develop and implement written policies and protocols to ensure:
  - Rapid identification
  - Isolation = negative pressure room on, or if none available a side room on the ward
  - Diagnostic evaluation
  - Treatment

Administrative Controls cont’d

- Educate, train, and counsel HCWs about TB
- Implement effective work practices among HCWs
- Educate & promote good cough hygiene with the patient
- Restrict visitors as much as possible i.e. household contacts only.
- Test HCWs for TB infection and disease if required
Patient assessment

- **Admission**
  - Not usually required
- **Site of TB**
  - Pulmonary TB
  - Non-pulmonary
- **Infectious**
- **Risk of MDR-TB**
- **Side room vs. negative pressure**
- **Other patients on the ward**

Patients should be considered infectious if they:
- Are coughing, or
- Are undergoing cough-inducing or aerosol-generating procedures, or

  Have sputum smears positive for acid-fast bacilli and they:
  - Are not receiving therapy
  - Have just started therapy, or
  - Have poor clinical response to therapy

- Patients are no longer considered infectious if they meet **all** of these criteria:
- Are on adequate therapy for 2 weeks and,
- Have had a significant clinical response to therapy
2. Engineering Controls

- To prevent spread and reduce concentration of infectious droplet nuclei
- Use ventilation systems in TB isolation rooms in 204 @ RIE or the infectious diseases unit @ WGH
- Use of HEPA filtration and ultraviolet irradiation with other infection control measures

3. Personal Respiratory Protection

- Use in areas where increased risk of exposure i.e. standard precautions plus FFP 3 masks
- TB isolation rooms until day 14 of treatment and/or unless MDRTB is suspected
- Rooms where cough-inducing procedures are done i.e. induced sputum, gastric washings, bronchoscopy etc
Drug resistant TB

- DR-TB = Drug resistant TB
- MDR-TB = Multidrug-resistant tuberculosis
- XDR-TB = Extensively drug-resistant TB

- MDR-TB and XDR-TB both take substantially longer to treat than ordinary (drug-susceptible) TB, and require the use of second-line anti-TB drugs, which are more expensive and have more side-effects than the first-line drugs used for drug-susceptible TB.

- Suspected/confirmed patients must go into a negative pressure side room
- All HCWs must wear filtered FFP3 masks
- Visitors can only include household contacts, but NO children
- Treatment dictated by sensitivity patterns
- Patients added to MDR forum for advice and surveillance.
The patient has known or suspected multi-drug resistant (MDR) tuberculosis.

When carrying out cough inducing procedures, for example bronchoscopy or sputum induction;

The patient has a pronounced, frequent productive cough;
- Undertaking tasks likely to increase contact with TB, for example making beds etc..
- When caring for a high dependency patient with known or suspected infectious tuberculosis, having or likely to have prolonged contact (i.e. greater than 8 cumulative hours) during the first 14 days of treatment.

**NHS Lothian Infection control policy**

- Any questions....