BASINGSTOKE AND NORTH HAMPSHIRE NHS FOUNDATION TRUST

Management of Patients with Known or Suspected Tuberculosis: Infection Control Issues

IC/198/10

Supersedes: previous policy IC/198/07

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<td>Name</td>
<td>Infection Control Committee</td>
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<td>Date of meeting</td>
<td>12 October 2010</td>
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<td>Review date</td>
<td>(maximum 3 years from date of authorisation)</td>
<td>2013</td>
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Summary
This is a clinical and infection control guidance document that outlines the management of patients and staff suspected or confirmed of having Mycobacterium tuberculosis infection. It is based primarily on guidelines from the National Institute for Health and clinical excellence/evidence (NICE). This policy does not include any detailed treatment or prophylaxis advice. It does not cover all eventualities and each incident needs to be risk assessed and control measures implemented accordingly.

Implementation Plan
Summary of changes
The format and contacts details have been updated. Algorithms from NICE guidelines added for reference. Section on occupational health and staff issues revised.

Action needed and owner of action
The policy applies to all clinical staff and should be adhered to at all times. The infection prevention and control team (IPCT) is responsible for monitoring compliance with the policy and regularly updating it.

The occupational health department is responsible for staff screening and management and for ensuring departmental protocols reflect up to date local and national guidance.

Clinical advice should be sought from the nominated chest Physician responsible for Mycobacterium infections (currently Dr Matti).

Each case should be risk assessed separately by the treating clinician with support from the IPCT. Control measures may have to be modified to allow for appropriate control

Audit and monitoring:
Standards:

- All cases suspected or confirmed of having mycobacterium tuberculosis infection are managed according to the infection control protocols stated in this policy
- All clinical staff are aware of this policy and are sufficiently trained to adhere to it

Method of monitoring:
- Audit of notification and management of each case by the infection control team
- Staff training records should show evidence of awareness of this policy and ability to comply with it
- Annual trust wide policy audit by ICT
1.0 Introduction

This policy for Basingstoke and North Hampshire NHS Foundation Trust is based on National Institute for health and clinical excellence (NICE) dated March 2006\(^1\). It covers the Infection Control issues surrounding the management of suspected or confirmed cases of Tuberculosis (TB) including staff. Tuberculosis (TB) is a serious but usually treatable infectious disease.

In 2009 the incidence of TB was 149/100,000 and a 5.5% increase on 2008. TB has increased by 25% over the last ten years in England and is still rising. Most TB occurs among people who live in inner cities. Two out of every 5 cases are in London\(^2\) however a rise has been seen in nearly all SHAs.

People are at higher risk of TB if they have lived in parts of the world where TB is more common. The disease follows patterns of immigration and is therefore more common in certain ethnic groups, especially those born abroad:

- in England, around seven out of 10 people with TB come from an ethnic minority population group
- nearly two thirds of England’s TB patients were born abroad
- about half of the TB patients who were born abroad are diagnosed with the disease within five years of first entering the country. A third are diagnosed more than two years after entry to the UK\(^1,2\)

HIV infection weakens a person’s immunity to TB. In 2003, TB contributed to 27% of the diagnosis of all AIDs cases in the UK. Cases of co-infection are increasing and can be difficult to treat especially with rise in drug resistant TB. All newly diagnosed TB cases should be tested for HIV infection after obtaining consent from the patient.\(^1-3\)

Left untreated, a person with infectious TB of the lungs (i.e. smear positive/open' TB) infects on average 10-15 people every year. The risk of a contact acquiring an infection depends upon the nature and duration of their exposure:

**TB risk from contact with an infected person\(^1,2,4\)**

<table>
<thead>
<tr>
<th>Nature of contact*</th>
<th>Risk of infection</th>
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<tr>
<td>None known</td>
<td>1 in 100,000</td>
</tr>
<tr>
<td>Casual social contact</td>
<td>1 in 100,000</td>
</tr>
<tr>
<td>School, workplace</td>
<td>1 in 50 to 1 in 3</td>
</tr>
<tr>
<td>Bar, social club</td>
<td>Up to 1 in 10</td>
</tr>
<tr>
<td>Dormitory</td>
<td>1 in 5</td>
</tr>
<tr>
<td>Home</td>
<td>1 in 3</td>
</tr>
<tr>
<td>Nursing home</td>
<td>1 in 20</td>
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* The duration of exposure is another major factor in interpreting these data
The long term national goal is a reduction, and ultimately elimination, of tuberculosis in this country. Working towards this goal, the immediate aims of the recently announced national TB programme and the NICE guidelines are to:

- reduce the risk of people being newly infected with TB in England
- provide high quality treatment and care of all people with TB
- maintain low levels of drug resistance, particularly multi-drug resistant (MDR) TB and the even more resistant form (XDR) TB

The rationale for control in the hospital setting is to prevent spread to other patients and staff, and is especially important for MDR-TB and XDR-TB.

The approach to the control of TB is based on risk assessment and contact tracing. Risk assessment includes:

- the degree of infectivity of the individual with TB (smear positive vs. smear negative TB)
- the possibility that the strain is resistant to antibiotics
- the vulnerability of individuals in contact with the infected individual
- the length and nature of an individual’s exposure to a person infected with TB

Contact tracing in the community is currently the responsibility of the Consultant in Public Health. Within the trust it is carried out by the Infection Control Team, Chest Physicians and Respiratory Clinical Nurse Specialist with additional input from Occupational Health for staff members.

2.0 Contact Details of Key Personnel

Dr Salah Matti – Consultant Physician ext 4923
Dr Nicki Hutchison – Consultant Microbiologist and Infection Control Doctor Ext 3310
Dr Fatima.El Bakri – Consultant Microbiologist Ext 3305
Infection Prevention and Control Team – Hazel Gray and Linda Swanson Bleep 2364 Ext 6774
Sarah Symonds – Respiratory Clinical Nurse Specialist ext 3641
Dr Linda Booth – Consultant in Communicable Disease Control, Hampshire and Isle of Wight Health Protection Unit 0845 055 2022

3.0 Notification/Surveillance

All forms of TB are compulsorily notifiable by the diagnosing physician to the local Consultant in Communicable Diseases Control

Notification must be made for two reasons:
- contact tracing can begin
- provide surveillance data to detect outbreaks and monitor epidemiological trends

The Infection Prevention and Control Team **MUST** also be informed of all patients and staff with TB in the Trust.

A decision to commence treatment of a patient (but not chemoprophylaxis) indicates a level of suspicion that should trigger notification for all forms of tuberculosis.
4.0 Management in Hospital

The treatment of TB should be undertaken in the patient’s home whenever possible. However, some patients will need admission because of the severity of illness, adverse effects of chemotherapy, for social reasons or for investigations to establish the diagnosis.

4.1 Risk Assessment

The risk assessment of patients with suspected TB is shown in Fig A below

Risk Factors for MDR-TB
It is crucial to risk assess the possibility of the patient having MDR-TB. These risk factors are:
- HIV infection
- Known contact of MDR-TB or XDR-TB case
- Previous drug treatment for TB
- Failure to respond to current drug therapy i.e. sputum microscopy positive at 4 months, or culture positive at 5 months on treatment

4.2 Isolation

See appendix A and Fig A for flow diagram

All patients with pulmonary TB should be isolated in a side room if possible.
Patients with smear positive TB must be isolated in a single room with en-suite facilities and the door kept closed.

Depending on the risks of MDR-TB and XDR-TB, some patients will require isolation in a negative pressure room. Such rooms are not available at BNHFT and patients with smear positive TB and any of the above mentioned risk factors for MDR-TB should be transferred to an infectious diseases unit with appropriate facilities e.g. Southampton or Oxford. While awaiting the results of microscopy of sputum from these ‘at risk’ patients, it is reasonable for them to remain in a side room on a ward with no immunocompromised patients.

Patients whose bronchial washings are microscopy positive for alcohol acid fast bacilli (AFB) can be managed as non-infectious unless:

- the sputum is also positive or no good quality specimen obtained
- or
- they are on a ward with immunocompromised patients,
- or
- they are known or suspected of having Multi drug resistant form of TB.

If a patient has a TB wound site, that requires irrigation, or the care of which may generate aerosols, isolation in a side room is necessary.

Within paediatrics, it is important to ensure that any child with active TB is nursed in a cubicle at the opposite end of the ward to any immunocompromised children by a separate team or nurses.
Figure A – Risk Assessment Of Patients With Suspected TB

**PATIENT WITH SUSPECTED TB**
- Inform consultant TB physician if not already caring for patient
- Inform ICT if pulmonary TB suspected

**Non-pulmonary 'closed' site TB.**
Is there a possibility of aerosol creating procedures i.e. abscess/wound irrigation? *
* Contact ICT for advice if required

**If pulmonary TB suspected, does the patient have any of the following risk factors for MDR-TB?**
- HIV infection
- Known contact of MDR-TB case
- Previous drug treatment for TB
- Failure to respond to current drug therapy i.e. microscopy positive at 4 months or culture positive at 5 months

**Admit/transfer to ward within side room with door closed.**
FFP 2 masks to be worn at all times within room.
Send 3 x sputa (or other appropriate specimens) for AFB microscopy

**Microscopy:**
- **AFB positive**
  - Admit/transfer to ward within side room with door closed.
  - If possible, ward should have no immunocompromised patients.
  - Send 3 x sputa (or other appropriate specimens) for AFB microscopy
  - Maintain isolation until the patient has received at least 2 weeks of anti-TB therapy including rifampicin and Isoniazid.
  - Discontinue isolation only on advice of Consultant Physician in charge of patient and ICT.

- **AFB negative**
  - Transfer patient to negative pressure room in ID unit
  - Maintain isolation in side Room, with no immunocompromised patients on ward.
  - Masks at all times

**YES**

**NO**

*Contact ICT for advice if required.*

**Isolation required**

**Isolation not required**

**Microscopy:**
- **AFB positive**
  - Maintain isolation in side Room, with no immunocompromised patients on ward.
  - Masks at all times

- **AFB negative**
  - Patient is not infectious. Isolation not required
4.3 Termination of isolation

This should be decided by the Consultant Physician caring for the patient and the Infection Control Team. **As a general rule isolation is no longer required if:**

- an immunocompetent patient has completed 2 weeks of anti TB therapy including isoniazid and rifampicin
- a patient suspected of having MDRTB who is smear negative has evidence from the reference laboratory that there is no rifampicin resistance on molecular testing, and has completed 2 weeks appropriate therapy guided by the chest physician
- if HIV +ve and smear negative the following criteria in addition to the above also need to be met:
  - completion of at least 2 weeks of appropriate multiple drug therapy and
  - demonstrated tolerance to the prescribed treatment and an ability and agreement to adhere to treatment and
  - either a complete resolution of cough or a definite clinical improvement to treatment e.g. remaining febrile for one week

4.4 Specimens

- It is extremely important to obtain specimens to determine whether an individual is infectious as quickly as possible so that:
  - appropriate treatment can be commenced
  - isolation facilities can be used appropriately
  - appropriate contact tracing can be carried out
- To enhance yield of mycobacteria, three early morning sputum specimens should be collected and sent promptly to the laboratory. Ideally this should be done on three consecutive days. However if there is a risk of MDR-TB/XDR-TB three specimens should ideally be collected and sent to the laboratory within 24 hours. This is to ensure the patient can be sent promptly to a facility with negative pressure rooms if the respiratory samples are smear positive.
- ‘Danger of infection’ should be labelled on specimens and request cards.
- Specimen cards should request ‘microscopy and culture for AFB’ in addition to any other tests requested by the physicians.
- If AFBs are seen on microscopy of sputum the patient must be regarded as infectious.
- Patients are not regarded as infectious if AFBs are not seen on microscopy of good quality sputum samples, but cultures subsequently grow a mycobacterium species.
- Sometimes a patient is unable to produce a specimen of sputum themselves simply by coughing. Physiotherapy and/or sputum induction may be required to obtain a sample. **This must not be carried out in an open ward area, and should only be attempted in a side room with the door closed, by staff wearing appropriate masks.**
- If Multi drug resistant TB is suspected, bronchoscopy, physiotherapy and/or sputum induction should only be performed in a negative pressure room i.e. after the patient is referred to another unit.
• Blood tests for TB (interferon-gamma test as per NICE flow diagrams in appendix B and C should only be done when indicated and after discussion with a Microbiologist and a chest physician.

4.5 Masks

• Masks do not routinely need to be worn by staff caring for smear positive patients unless they are:
  i. carrying out sputum induction, chest physiotherapy or bronchoscopy
  ii. carrying out prolonged care of a high dependency patient e.g. ‘specialing’ a patient for a shift
  iii. performing wound irrigation or procedures that will create an aerosol and TB has been isolated from the wound

• For patients with suspected MDR-TB:
  i. all visitors and healthcare workers must wear masks on entering the patient’s room.

• The correct masks to wear when caring for patients with TB are FFP2 masks meeting the 1992 Personal Protective Equipment (EC Directive) Regulations. All staff and visitors must be instructed how to fit the mask correctly.

4.6 Cleaning Protocols

Linen, crockery and cutlery

No special precautions are needed

Daily cleaning of the room

It is important to clean the room once a day (using standard cleaning protocols) paying particular attention to any horizontal surfaces that may become contaminated with microscopic droplets from either coughing, or following irrigation of a wound draining TB.

Terminal Cleaning

Terminal cleaning of the isolation room using a chlorine releasing agent at 1000ppm available chlorine must be carried out if the patient is discharged or transferred. Curtains should be changed.

Fumigation of rooms that have housed patients with TB is unnecessary

4.7 Transport Arrangements

All staff in close contact with a patient who is to be transferred to a negative pressure room at a tertiary referral centre, because of smear positive disease where MDR or XDR-TB is suspected, must wear appropriate filter masks e.g. FFP3.

When a patient is in isolation with known or suspected pulmonary TB they should not be transferred to other hospitals or departments unless this is essential for their care e.g. transfer to ITU, emergency investigations.

If a patient has TB in a wound/drain site etc this should be covered with an occlusive dressing.
4.8 Last Offices

- The risk of infection from the deceased individual with TB is small.
- The deceased infected individual should be placed in a cadaver bag and a ‘Danger of Infection’ sticker attached for transfer to the mortuary.
- If performing last offices for a patient with suspected MDR-TB it is still necessary to wear masks.
- Mortuary staff must be informed that the patient was infected with TB.

5.0 Contact Tracing

In the ward setting if a patient is found to have smear positive pulmonary TB with cough, and has been an inpatient in an open ward area it may be necessary to follow up patients who have been in significant contact with the infectious individual. Transmission in this situation is not common but some patients may be at increased risk.

A significant contact in the hospital setting is defined as any patient in the same bay as a patient with a cough and smear positive TB, who has been exposed for a period of 8 hours or more.

Patients elsewhere on the ward should be regarded as significant contacts if they are immunocompromised and the exposure was for more than 48 hours.

The Infection Control Team together with the ward manager will draw up a list of contacts.

The Infection Control Team will then liaise with the Consultants responsible for the patients who are contacts to ensure appropriate follow up. Action will be discussed with the Health Protection Unit and when appropriate a letter (see Appendix D&E) will be sent to the patient, their consultant and GP informing them of the exposure.

Staff are not considered significant contacts unless they have:
- performed mouth to mouth resuscitation
- undertaken prolonged care of a high dependency patient i.e. ‘specialed’ for a shift, without wearing a mask
- carried out repeated chest physiotherapy without wearing a mask
- HIV positive or immunocompromised themselves

6.0 Operating Theatres

Patients with infectious pulmonary TB who require an operative procedure must be kept separate from other patients in the theatre.

Patients with TB in a closed body site do not need to be separated from other patients.

Ward staff must ensure that theatre staff are made aware if a patient with infectious pulmonary TB is to attend theatres, so that necessary infection control precautions can be arranged before the patient arrives in the department.
7.0 Outpatient Department

If possible attendance of a patient with infectious pulmonary TB to the outpatient department should be delayed until the patient is no longer infectious unless the appointment is urgent. The risk of transmission in this setting is low as the exposure time of a patient to an infected individual is unlikely to be prolonged, but contact with other patients must be minimised including during ambulance journeys.

If the patient has TB in a wound/drain site this should be covered with an occlusive dressing. If further advice is required please contact Infection Control.

8.0 Staff

1. Studies have shown there is no increased risk of TB in healthcare workers in the UK except in mortuary and laboratory workers.

2. All staff must have their immune status checked on employment by Occupational Health, and must show evidence of immunity before caring for patients with infectious TB (See appendix F for new employees flow diagram)

3. The above advice also pertains to bank and agency staff. The ward co-ordinator must seek assurance from any bank or locum staff that BCG status has been checked, before allocating them to care for a patient with infectious TB.

4. In a minority of cases skin testing may not be possible and a Gamma interferon test should be considered as per NICE advice e.g. if previous BCG or immunocompromised. Occupational Health should advise the individual regarding the precautions when caring for patients with infectious pulmonary TB.

5. If a health care worker is suspected or confirmed of having TB, Occupational Health, CCDC and ICT should be informed promptly to allow for risk assessment and contact tracing to be undertaken
9.0 References

6. Tuberculosis Update. 2010. Health Protection Agency
Appendix A: NICE algorithm for isolation decisions for patients with suspected respiratory TB

1. Known or suspected MDR TB, based on risk assessment?
   - Yes: Admit to negative-pressure room
   - No: Admit to single room

2. Sputum smear positive (1 or more from 3 samples)?
   - Yes: Next decision point
   - No: Next decision point

3. Risk for MDR TB?
   - Yes: Next decision point
   - No: Next decision point

4. Does ward have immunocompromised patients?
   - Yes: Next decision point
   - No: Next decision point

5. Does ward have immunocompromised patients?
   - Yes: Negative-pressure room or another ward
   - No: Single room on ward if possible or standard ward

6. Negative-pressure room (irrespective of HIV status). Molecular probe for rifampicin resistance

7. Single room on ward

Known or suspected MDR TB, based on risk assessment?
Appendix B: NICE flow chart for Testing and treating asymptomatic close contacts of all cases of active TB

- For children aged between 4 weeks and 2 years old who are contacts of people with sputum smear-positive TB, use the algorithm on page 64.
- Previous BCG vaccination cannot be accepted as evidence of immunity in HIV-infected patients.
- A negative test in immunocompromised people does not exclude TB infection.
- People advised to have treatment for latent TB infection, but who decline, should have 'Inform and advise' information reinforced and chest X-ray follow-up at 3 and 12 months.

NICE guideline – tuberculosis
Appendix C: NICE Flow chart for testing and treating asymptomatic children older than 4 weeks but younger than 2 years who are contacts of people with sputum smear-positive TB
Appendix D

Draft Letter for General Practitioners and Consultants

Dear X,

Your patient Y was an inpatient at Basingstoke and North Hampshire Hospital at the same time as another patient with potentially infectious tuberculosis.

We do not think it is likely that your patient is at significant risk of infection, and no specific action need be taken unless you are aware that they are unusually susceptible to infectious diseases.

In the very unlikely event of your patient consulting you in the future with persistent symptoms which are consistent with a diagnosis of tuberculosis, then you will wish to keep this possible exposure to the disease in mind.

The patient has been advised of the exposure.

Yours sincerely
Appendix E

Draft Letter for Patients Present On the Same Ward as A Case of Infectious Tuberculosis

Dear X

During a recent stay in hospital there was a patient on Y ward who was diagnosed as having tuberculosis.

It is routine procedure for us to inform individuals like yourself who may have potentially come into contact with the person with tuberculosis. This information has also been passed on to your consultant and general practitioner.

We do not believe that you are at any significant risk and no further action need be taken.

If you do have any particular concerns or believe yourself to be at particular risk of infectious disease, you could discuss this with your doctor

Yours sincerely
Appendix F

NICE: Screening new NHS employees

1. Pre-employment questionnaire

2. New entrant?
   - Yes: Chest X-ray
   - No: Suspicious symptoms?

3. Suspicious symptoms?
   - Yes: Medical assessment, chest X-ray
   - No: Normal?

4. Normal?
   - Yes: Working with patients or clinical materials?
     - Yes: Prior BCG (scar or documented)?
       - Yes: Mantoux/interferon-gamma test positive?
         - Yes: Medical assessment
         - No: Risk assessment
       - No: Mantoux/interferon-gamma test, unless performed in past 5 years
     - No: ‘Inform and advise’, consider treatment for latent TB infection

5. Working with patients or clinical materials?
   - Yes: Prior BCG (scar or documented)?
     - Yes: Mantoux/interferon-gamma test positive?
       - Yes: Medical assessment
       - No: Risk assessment
     - No: Prior BCG (scar or documented)?
       - Yes: Mantoux/interferon-gamma test positive?
         - Yes: Medical assessment
         - No: Risk assessment
       - No: ‘Inform and advise’, consider treatment for latent TB infection

6. Prior BCG (scar or documented)?
   - Yes: Mantoux/interferon-gamma test positive?
     - Yes: Medical assessment
     - No: Risk assessment
   - No: ‘Inform and advise’, consider treatment for latent TB infection

7. Medical assessment
   - Suspicious symptoms or circumstances?
     - Yes: Chest X-ray normal?
       - Yes: ‘Inform and advise’, consider treatment for latent TB infection
       - No: TB clinic
     - No: ‘Inform and advise’, consider treatment for latent TB infection
   - No action

8. Chest X-ray normal?
   - Yes: ‘Inform and advise’, consider treatment for latent TB infection
   - No: TB clinic

9. Record refusals

10. Notify occupational health

11. ‘Inform and advise’, consider treatment for latent TB infection

*New entrants are people arriving in or returning to the UK from a high-incidence country (more than 40 cases per 100,000 per year, as listed by the Health Protection Agency; go to www.hpa.org.uk and search for ‘WHO country data TB’).