St George's Healthcare NHS
NHS Trust

Protocol for the care of patients with tuberculosis

Policy Profile			
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1	2002	2004	
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3	2012	2015	Reviewed and updated in line with guidance.

Contents

Executive Summary

This document is an evidence-based protocol for the implementation of sound tuberculosis (TB) infection control by all healthcare workers. TB infection control is a combination of measures aimed at minimising the risk of TB transmission to patients, staff and others. The basis of TB infection control is early and rapid diagnosis and the appropriate management of infected patients.

Scope

This protocol applies to all staff (temporary or permanent) **working in any of the locations registered by St George's Healthcare NHS Trus**t with the Care Quality Commission (CQC), to provide its regulated activities. Locations are not necessarily geographically based or determined. Therefore the term locations does not just refer to Trust buildings; it is the term used by the CQC to describe the hub of operations for a service or range of services and so includes all activities being performed in the course of performing one's role.

This includes volunteers, contractors, students and/or trainees.

Note: Trust staff at HMP Wandsworth should use this protocol in conjunction with the following HPA documents:-
Guidance for Health Protection Unit on responding to TB incidents and outbreaks in prison (Jan 2010)
Prevention of Infection and Communicable Disease Control in Prisons & Places of Detention. A Manual for Healthcare Workers and other Staff (2011)

There should be a high level of suspicion for TB in the prison population. Staff should continue assessments of individuals with suspected pulmonary disease according to the algorithm (see appendix D) and seek advice from the respiratory nursing team or the Infectious Diseases registrar.

This protocol is an appendix to the Infection Control Policy. Refer to the Infection Control Policy for information on the criteria, responsibilities and systems required to prevent and control Healthcare Associated Infections (HCAIs).

1. Introduction

Tuberculosis (TB) is an infectious disease caused by bacteria belonging to the *Mycobacterium tuberculosis* complex (HPA, 2010). TB commonly affects the lungs (Pulmonary Respiratory TB) but can affect any organ or tissue (extra-pulmonary TB). Pulmonary disease remains the most common type of TB worldwide and is usually spread during the expiratory efforts (coughing or sneezing) of people infected with pulmonary or respiratory tract TB. Those affected with Pulmonary TB most commonly present with a persistent cough, weight loss, severe night sweats, tiredness and some may present with coughing up blood. Prolonged or repeated close exposure to an infectious person may lead to infection of contacts (Heymann, 2004). A cumulative contact of eight hours is considered sufficient. Incubation period is usually 4 to 12 weeks but some may not progress to active disease until within 5 years of infection. For others the infection may lay dormant and will develop active disease later in life if predisposed with another debilitating illness.

TB is usually curable with a combination of specific antibiotics, but treatment must be continued for at least six months (HPA, 2010). Multi Drug Resistant Tuberculosis (MDR TB) is a specific form of TB due to a bacillus resistant to at least isoniazid and rifampicin, the two most effective anti-TB drugs. Extensively Drug Resistant Tuberculosis (XDR TB) is resistant to both first and second line drugs meaning treatment options are significantly limited. It is therefore vital that TB control is managed properly (WHO, 2011).

Most patients with TB can be treated at home; a few need hospital admission for severe illness, adverse effects of chemotherapy or social reasons.

The World Health Organization declared TB a global emergency in 1993. Around 9000 cases of TB are currently reported each year in the United Kingdom with most cases occurring in major cities, particularly London.

2. Mode of Transmission

TB is spread from person to person by respiratory droplets; these are produced when a patient with pulmonary or upper respiratory tract disease speaks, laughs or coughs. Healthcare workers are also exposed during procedures such as bronchoscopy, sputum induction, CT guided biopsy, intubation, thoracic surgery and autopsy and other invasive procedures. Prolonged close contact with an infected person (e.g. household contacts and work colleagues).

3. Risk of Transmission

- Any patient with suspected pulmonary disease with or without an abnormal chest x-ray,
- Suspected laryngeal tuberculosis,
- MDR TB
- Dual infection with HIV.
- Other immunosuppresed conditions

This list is not exhaustive; there may be other risks that need to be assessed in individual cases.

4. Extrapulmonary Tuberculosis

- TB affecting organs other than the respiratory tract, skin TB and discharging cold abscesses are not a high infection risk. Examples of extrapulmonary TB are meningeal TB, peripheral lymph node TB, bone and joint TB and pericardial TB.
- Treat skin TB/discharging diseases as "Pulmonary Respiratory TB" (below).
- Seek out possible concomitant respiratory disease in all patients with extrapulmonary disease.
- If there is no evidence of pulmonary involvement, respiratory isolation is not necessary.
- Management in a side-room is preferable, and should be instituted until pulmonary disease has been excluded.

5. (a) Respiratory Tract Tuberculosis – *Sensitive Strains*

- Whenever there is any **suspicion** of respiratory TB, the patient must be placed in respiratory Isolation in a **negative pressure** room on McEntee ward with doors closed. The Infectious Diseases Registrar or TB nurses or Paediatric Registrar (if child) must be contacted. The ward should also inform the Infection Control Team (See Algorithm1).
- If pulmonary TB excluded or three consecutive AFB negative then respiratory isolation may be discontinued.
- Respiratory Isolation in a negative pressure room should be continued for 2 weeks after the start of chemotherapy or longer, at the discretion of the chest/infectious disease physician, unless discharge to "home isolation" is permitted. (See Algorithm).
- If **HIV patients** are nursed on the same ward then confirmed/suspected respiratory TB patients must be nursed in respiratory Isolation in a **negative-pressure** single room which has air pressure continuously or automatically measured (NHS Estates, 2005). The ward must hold an action plan in case of failure of air-flow control.
- **Paediatric patients** must be managed in Respiratory Isolation in a single room on Pinckney ward. The door must be kept closed.

Infection Control measures

- **Gloves and Aprons** - should be worn by staff when dealing with materials directly contaminated with sputum or for procedures such as suction and induced sputum collection.

- **Masks (Staff**) Staff must wear **surgical masks (blue)** when entering the isolation room if there is no suspicion of MDR TB/ XDR TB. When masks are worn, the reason should be explained to the patient with TB. If MDR TB/ XDR TB is suspected or cough inducing or aerosol generating procedures are being performed, staff must wear an **Filtering face piece (FFP3) mask.**

- **Masks (Patients)** Patients with respiratory TB (sensitive strains) must (with explanation) wear a **surgical mask (blue)** when they leave their single room until they have had at least two weeks drug treatment as they may come into contact with other susceptible patients (NICE, 2006). If they have a productive cough, patients should be instructed to cough and expectorate into tissues. They do not need to wear masks whilst in their isolation room or when receiving visitors.

- **Masks (Visitors)** Visitors who are not household contacts must wear **a surgical mask (blue)** at all times when in the patient's room as long as the patient is considered potentially infectious.

- Any employee of the Trust who develops an illness suggestive of TB, such as a cough of more than two weeks duration including fever, night sweats, weight loss and general malaise should seek medical advice either from Occupational Health or their GP.

- If a patient with active TB dies, the body must be placed in a body bag and clearly labelled to alert mortuary/undertakers staff to the risks. Encourage relatives and friends to view the body before sealing the bag and removal, where possible. See Last Offices guidance.

- **Other Departments.** Patients' visits to other departments should be minimised. The receiving department must be informed in advance of the patient's infection risk. Patients should be seen promptly and should stay in shared patient areas for the minimum possible time. A **surgical mask (blue)** must be worn by patient during transfer to another department.

(b) Respiratory Tract Tuberculosis (Open TB) - *Multi Drug Resistant (MDR TB) and Extensively Drug Resistant Tuberculosis (XDR TB) Strains*

MDR TB/ XDR TB is not more virulent or more infectious than other forms of TB, but the consequences of acquiring disease are much more serious because of the complexities and duration of the required treatment regimens. A risk assessment for drug resistance should be made for each patient with TB, based on the risk factors listed below (NICE, 2006):

a. a history of prior drug treatment; prior TB treatment failure
b. contact with a known case of drug-resistant TB
c. birth in a foreign country, particularly high incidence countries (go to www.hpa.org.uk)
d. HIV infection
e. residence in London
f. age profile, with highest rates between 25 and 44
g. male gender.

In addition to the infection control measures for patients with sensitive strains of Respiratory Tract Tuberculosis, the following additional precautions are necessary for patients with MDR TB:

- Patients with suspected or known MDR TB/ XDR TB must be nursed in Respiratory Isolation on McEntee ward in a **negative-pressure** single room, **with at least twelve air changes per hour** until the clinician in charge of the case considers them non-infectious.

- **Masks.** Staff and visitors must wear **FFP3 masks** during contact with a patient with suspected or known MDR TB/ XDR TB while the patient is considered infectious. Staff should be fit tested on how to correctly fit FFP3 masks.
  Staff should fit check their mask each time to ensure a good fit with no air leaks.
- Patients do *not* need to wear masks while in their isolation room with other people, but if productive should be instructed to cough and expectorate into tissues.

- **Other departments and MDR TB/ XDR TB**
  a. Patients should not visit other departments unless this has been discussed with the chest/infectious disease physician and the Infection Control Team. The receiving department must be informed in advance of the patient's infection risk.
  b. The **patient** must wear an **FFP3 mask** during transfer and whilst in the department. Patients should be shown how to fit check the mask to ensure it provides a good seal with no air leaks. The mask should only be removed if the patient's condition or procedures being performed require it.
  c. Patients should be last on the list or seen separately, and taken straight into the room where the investigation/treatment is to be performed. When they arrive they should not be kept waiting in the corridor or in shared areas with other patients or members of the public.
  d. The number of staff in the room must be limited to the minimum required to carry out the procedure safely.

e. All staff present at the procedure must have a satisfactory reaction BCG status checked on employment and be immune competent. If there are any doubts, please consult with the Occupational Health Department.

f. All staff must wear an **FFP3 masks** at all times when in contact with the patient. Staff should be fit tested on how to correctly fit FFP3 masks and fit check the mask following each application. After leaving the isolation room or in the ante-room remove and dispose of mask in clinical waste bin. Once removed, masks must not be re-used.

g. Gloves and aprons do not need to be worn unless dealing with materials directly contaminated with sputum or for procedures such as suction and induced sputum collection.

h. The patient should be encouraged to cough and expectorate into tissues. Tissues and gloves that have come into contact with sputum should be disposed of in an orange clinical waste bag. This clinical waste bag does not need any "special" tagging and should be disposed of in the normal way.

i. No "special" cleaning of the room is necessary unless sputum lodges on any equipment or surface. Sputum contaminated areas should be cleaned with chlor–clean or other appropriate disinfectant.

j. Once the patient has left the room it must be **deep cleaned.**

- **Bronchoscopy and MDR TB/ XDR TB**

The case should be discussed with a consultant experienced in the management of MDR TB/ XDR TB.

a. Bronchoscopy must be performed in a negative pressure room which maintains at least twelve air changes per hour.

b. The numbers of staff present in the room must be limited to the minimum required to safely carry out the procedure.

c. All persons attending the procedure must have had a satisfactory reaction BCG or a positive Heaf test. If there are any doubts please consult with the Occupational Health Department.

d. All persons attending must wear:-

- FFP3 masks, to be worn at all times when in contact with the patient. These masks should be correctly fitted and staff should have received training on how to fit them correctly.

- Disposable gloves and appropriate eye protection e.g. goggles or fluid shields attached to masks and gowns must be worn.

e. Samples taken for laboratory procedures must be put in a sterile container and sealed immediately to reduce the risk of aerosols and labelled “high risk”.

f. Ensure the lid of the container is secured tightly to avoid leakage.

g. The bronchoscope must be put in a clear plastic bag and sent to the Endoscopy Unit for disinfection immediately. This needs to be done in liaison with staff from the Endoscopy Unit; wherever possible liaison should take place before the procedure is commenced. The Endoscopy unit must always be informed **before** the bronchoscope is sent to them. (see Decontamination policy).

6. Induced Sputum Specimens – sensitive and MDR TB/ XDR TB

Induced sputum may be used for diagnosis and for monitoring infectivity of MDR and XDR TB but should not be used for routine monitoring infectivity of drug-sensitive TB.

Induced sputum collection from patients with suspected TB must only be undertaken in a designated negative pressure rooms on McEntee (Clinical Infection Unit) or in the GUM clinic (designated treatment room).

- Induced sputum specimens taken from patients with either resistant *or* sensitive strains or suspected tuberculosis *must not* be obtained in the presence of other patients and there must be only the minimum number of staff present to perform the procedure safely.

- Staff must wear FFP3 masks during cough inducing or aerosol generating procedures.

- A sign prohibiting entry must be placed on the outside of the door whilst induced sputum specimens are being obtained.

- No airing period is necessary before or after the induction process provided the procedure has taken place in a negative pressure room with at least 12 air changes per hour.

7. Contact Tracing

- Contact tracing may identify additional cases of tuberculosis that may have been infected by or be the source of infection for the index case. It also identifies those who may benefit from other interventions such as chemoprophylaxis.
- Contact tracing should be undertaken promptly to minimise the risk of an unidentified case continuing to infect others, especially if some of the contacts are immunocompromised.

- Once a patient has been diagnosed with smear-positive sputum, the diagnosing physician should inform Clinical Infection Unit SpR and TB nurses so that the need for contact tracing can be risk assessed without delay. The risk assessment should take into account:
  - the degree of infectivity of the index case
  - duration and proximity of contact
  - the length of time before the infectious patient was isolated
  - whether other patients/ staff were unusually susceptible to infection- for example young children or immunocompromised adults.

  - Each contact (staff and patient) will be risk assessed on an individual basis taking into consideration the nature and extent of exposure. (see Algorithm1).

8. Management of Significant TB-related Incidents
The information below relates to a Significant TB incident at the Trust.

Need to first of all identify that an incident has been recognised and then describe internal and external alerting (e.g. to HPU) mechanisms. For example a patient with highly infectious tuberculosis has been on an open ward for more than eight hours.
Need to have TOR for Incident Management Team (IMT).
Clear roles and responsibilities of incident team

Membership of IMT
Infection Control Doctor to convene and chair an incident meeting comprising of:
Infection Control Doctor or Deputy Infection Control Doctor – Chairman
Consultant in Infectious Diseases
Consultant in Acute & Respiratory Medicine
Chest Physician
Infection Control Nurse
TB Nurse

Matron of the affected ward/department
Link Nurse for Infection Control of affected ward/department
Nurse Manager/Ward Sister of the affected ward/department
Consultant in Occupational Health /Occupational Health Nurse
HPU Representative
Communications Officer
Divisional manager or a representative

Occupational Health

- to make a record of all staff contacts
- to determine whether staff immune competent or immunocompromised
- to determine whether occupational health screening required.

TB Nurses

- to make a record of all patient contacts
- to make a record of close household contacts and determine whether health screening is required. If transmission is identified among these to an extent (usually if 10% positive in household screening/after first screening in an institution) which suggests a greater degree of infectiousness of the index case, the screening can be extended to a larger group (the 'stone in the pond' principle).

Decision whether hospital screening for staff/patients required is made by the Incident Management Team and:

1) informed by results of close contact household screening
2) level of exposure of staff and patients
3) smear status of case

If patient receiving treatment at home the TB nurses employ the "directly observed therapy" rule to enhance compliance.

Communications Officer

- to release the appropriate information, the Infection Control Doctor will be responsible for the provision of information.

(The Interdepartmental Working Group on Tuberculosis, 1998)

9. Associated Documents

Infection Control Policy
Hand Hygiene Policy
Isolation Protocol
Outbreak Protocol
Surveillance Protocol
Reporting HCAI to HPA

10. References

Health Protection Agency, Department of Health (2011) *Prevention of Infection & Communicable Disease Control in Prisons & Places of Detention. A Manual for Healthcare Workers and other Staff.* Available from: Gateway reference HPA 11-02, DH 16314. London: HPA/DH.

Guidance for Health Protection Unit on responding to TB incidents and outbreaks in prison (2010) Available from: http://www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1263812654991

Health Protection Agency (2010) *Tuberculosis (TB).* Available from: http://www.hpa.org.uk/Topics/InfectiousDiseases/InfectionsAZ/Tuberculosis. [Accessed 18 February 2011].

Heymann, D. L. (2004) *Control of Communicable Diseases Manual,* 18th ed. Baltimore: United Book Press.

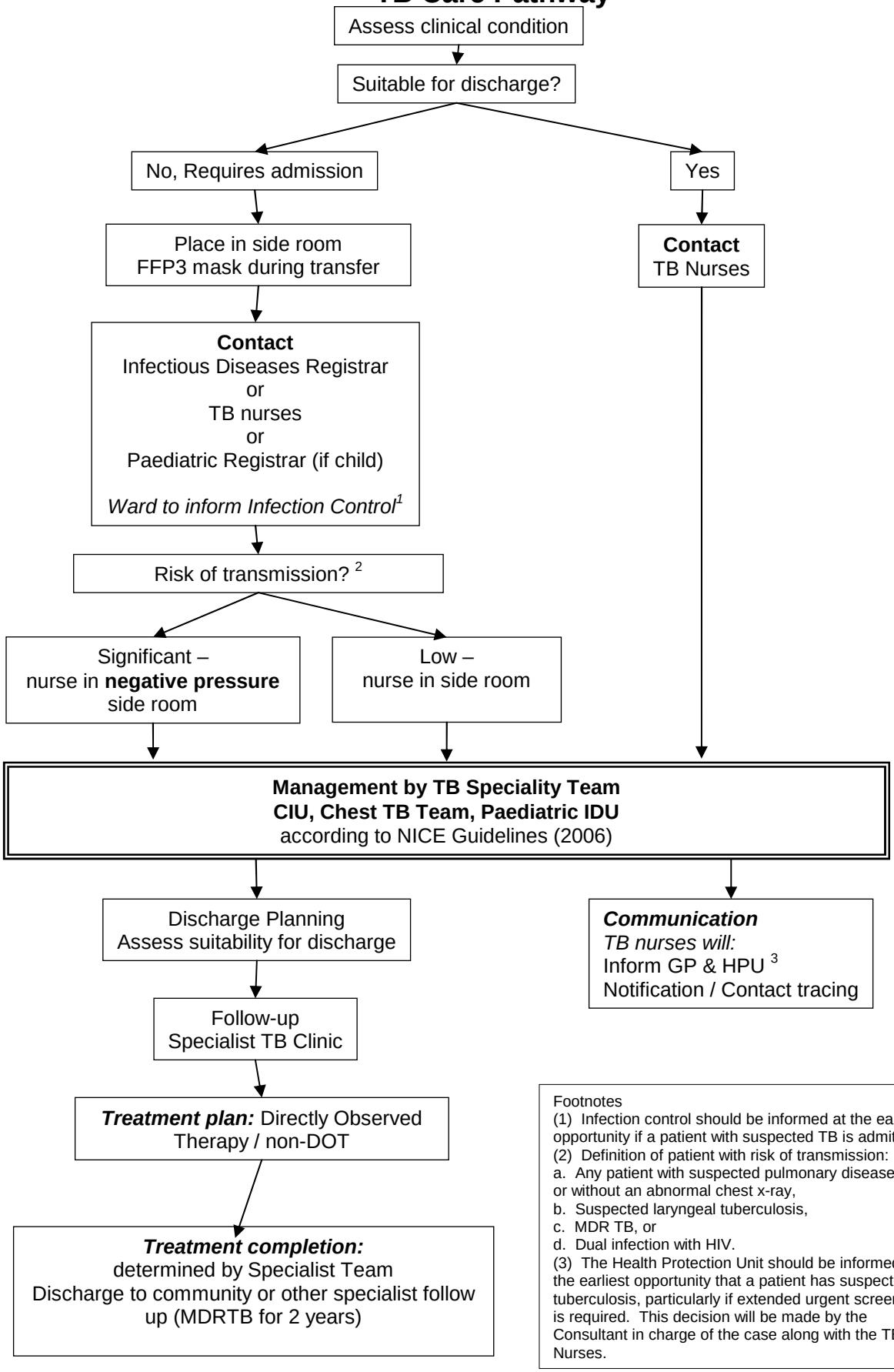
NHS Estates (2005) *In patient accommodation: options for choice. Isolation facilities in acute settings HBN4 supplement 1.* [Online] Available from: www.dh.gov.uk. [Accessed 18 February 2011]

National Institute for Health and Clinical Excellence (2006) *Tuberculosis: Clinical diagnosis and management of tuberculosis, and measures for its prevention and control*. London: NICE.

The Interdepartmental Working Group on Tuberculosis (1998) *The prevention and control of tuberculosis in the United Kingdom: UK guidance on the prevention and control of transmission of: 1. HIV-related tuberculosis 2. drug-resistant, including multiple drug-resistant, tuberculosis*. London: Department of Health.

World Health Organisation (2011) Tuberculosis. [Online]. Available from: www.who.int/topics/tuberculosis/en/. [Accessed 18 February 2011].

Algorithm 1
TB Care Pathway



Footnotes
(1) Infection control should be informed at the earliest opportunity if a patient with suspected TB is admitted.
(2) Definition of patient with risk of transmission:
a. Any patient with suspected pulmonary disease with or without an abnormal chest x-ray,
b. Suspected laryngeal tuberculosis,
c. MDR TB, or
d. Dual infection with HIV.
(3) The Health Protection Unit should be informed at the earliest opportunity that a patient has suspected tuberculosis, particularly if extended urgent screening is required. This decision will be made by the Consultant in charge of the case along with the TB Nurses.