SOP Objective

To ensure that patients with tuberculosis are diagnosed and treated promptly and their contacts followed-up to minimise the risk of cross-infection and to identify further cases.

This SOP applies to all staff employed by NHS Greater Glasgow & Clyde and locum staff on fixed term contracts and volunteer staff.

KEY CHANGES FROM THE PREVIOUS VERSION OF THIS SOP

- Inclusion of Occupational Health in Section 1.
- Updates have been made to Exposure, Contact Tracing, PPE, Precautions Required until and Screening on Admission in section 3
- Decolonisation, Furniture and Marking Notes have been removed
- Ventilation has been removed from Section 3
- Audit has been removed
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The most up-to-date version of this SOP can be viewed at the following website: www.nhsggc.org.uk/your-health/public-health/infection-prevention-and-control/
1. Responsibilities

**Healthcare Workers (HCWs) must:**
- Follow this SOP.
- Wear Personal Protective Equipment (PPE) and respiratory protection if advised to do so.
- Inform a member of the Infection Prevention Control Team (IPCT) if this SOP cannot be followed.

**Managers must:**
- Ensure HCWs have access to this SOP.
- Support HCWs and IPCTs in following this SOP.
- Ensure HCWs are aware how to use respiratory protection and have access to effective equipment and are fit tested.

**IPCTs must:**
- Keep this SOP up-to-date.
- Provide education opportunities on this SOP.
- Take the lead role in conjunction with the ward manager, consultant in charge and microbiologist to identify in-patients who have had sufficient exposure to the index case to merit screening.

**Clinicians must:**
- Notify Public Health of any newly diagnosed patient.
- Notify the TB Liaison Nurse of any newly diagnosed patients.

**Laboratories / Microbiologists must:**
- Report positive smears and cultures to the clinician urgently by telephone.
- Report positive smears and cultures to Consultant in Public Health Medicine (CPHM) and TB Liaison Nurse. Local policy may apply.
- Inform the IPCT.

**CPHM must:**
- Provide Health Protection Scotland (HPS) with data on cases through the Enhanced Surveillance of Mycobacterial Infection (ESMI) scheme.
- Undertake timely analysis of epidemiological and laboratory data to reveal clusters/outbreaks if they occur.
- Communicate findings to local NHS Services, HPS and the Scottish Government.

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TB Liaison Nurse:
- Liaise with Clinicians, IPCT and CPHM.
- Identify community contacts promptly and arrange appropriate screening.
- Take a leading role in advising and informing the patient and the patient’s contacts in the community for the duration of therapy.
- Liaise with Occupational Health regarding the provision of information and advice to staff exposed to a patient with smear/sputum positive TB.

Occupational Health:
- Take the lead role in identifying; advising and informing staff exposed to a patient with smear positive pulmonary TB.
2. General Information on Tuberculosis

<table>
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<tr>
<th>Communicable Disease/ Alert Organism</th>
<th>Tuberculosis is a disease caused by infection with the Mycobacterium tuberculosis complex of organisms (M. tuberculosis, M. bovis, M. africanum and M. micoti) which may cause pulmonary and/or non-pulmonary tuberculosis.</th>
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<tbody>
<tr>
<td>Clinical Condition(s)</td>
<td>Pulmonary or non-pulmonary tuberculosis.</td>
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<tr>
<td>Definitions</td>
<td>TB Infection: defined as the bacteria having caused an immune reaction with no evidence of disease.</td>
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<td></td>
<td>TB Disease: the patient has symptoms or clinical evidence of disease.</td>
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<td></td>
<td>Sputum smear positive = infectious</td>
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<td></td>
<td>Sputum smear negative = low infectivity risk</td>
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<td>Mode of Spread</td>
<td>Airborne: The infectious particles are very small droplets (1-5µ) containing tubercle bacilli expelled during talking, singing but especially coughing, and inhaled by susceptible individuals.</td>
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<tr>
<td>Incubation period</td>
<td>2-8 weeks to cause an immune reaction. May be many years before disease develops.</td>
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<td>Notifiable disease</td>
<td>Yes. It is the clinician’s responsibility to notify the Public Health Protection Unit (PHPU), Gartnavel Royal Hospital (West House, 1055 Great Western Road, Glasgow G12 0XH. Notification may also be by the Pathologist. <strong>NB</strong> notification (not confirmed) is on suspicion – usually considered to be equivalent to initiation of therapy. Telephone PHPU - 0141 201 4917 (64917)</td>
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<tr>
<td>Persons most at risk</td>
<td>• Individuals whose cumulative exposure time to a sputum smear positive patient is more than 8 hours.</td>
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<td></td>
<td>• Those who have immunodeficiency for any reason.</td>
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<tr>
<td>Additional Information</td>
<td>• Around 10% of those infected actually develop the disease; half within one year of infection, 80% within two years.</td>
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<td></td>
<td>• Infected persons who are immunocompromised, particularly those who are HIV positive have a significantly higher risk of developing TB disease.</td>
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<td></td>
<td>• Patients with extra-pulmonary disease can be considered non-infectious other than in exceptional circumstances such as open</td>
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</table>
3. Transmission Based Precautions

**Accommodation**

- **Suspected TB**: single-room is required for all patients thought to have pulmonary tuberculosis until the patient has 3 smear negative sputum specimens or in the case of a child, negative gastric washings.

- **Smear positive TB**: if possible, place patient in a negative pressure single room until 14 days therapy and definite clinical improvement, i.e. absence of cough. The patient may be discharged before the 14 days.

- **Confirmed Multi-Drug Resistant TB**: negative pressure in a single room with an en suite is mandatory for those patients with, or suspected of having pulmonary multi-drug resistant (MDR-TB) until discharge from hospital. Staff must ensure that negative pressure is working.

Patients who have had smear positive TB and have had 14 days therapy and are improved must not on release from isolation be placed next to HIV positive or other immunocompromised patients, if remaining in hospital. If this is unavoidable (ie return to home environment with immunocompromised individual) then the patient must have 3 negative sputum smears before leaving isolation.

*If the patient is clinically unsuitable to be placed in a single room or door cannot remain closed, a risk assessment must be undertaken by the clinical team in conjunction with a member of the IPCT.*

Admission to hospital is not usually necessary for patients with tuberculosis (TB). The patient may be discharged before 14 days of therapy if:

- They are tolerating TB treatment
- There are not believed to be any issues regarding compliance to treatment
- The person has a fixed address
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<tr>
<th><strong>Care Plan available</strong></th>
<th>Yes.</th>
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<tr>
<td><strong>Clinical / Healthcare Waste</strong></td>
<td>Waste should be designated as clinical/ healthcare waste and placed in an orange bag. Please refer to the NHSGCC <a href="http://www.nhsggc.org.uk/your-health/public-health/infection-prevention-and-control/">Waste Management Policy</a>.</td>
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<tr>
<td><strong>Contact tracing</strong></td>
<td>The TB Liaison Nurse will assess all community contacts of the patient. Working with the TB Liaison Nurse, the IPCT, microbiologist and senior ward staff will assess if any other patients have had sufficient exposure during the patient stay (&gt;8 hours close contact with a sputum smear positive patient). In paediatrics, resident parents/ guardians must be assessed. For hospital patient contacts, the patient’s Consultant will inform their General Practitioner of the exposure. They will also be informed of any relevant subsequent action. The Consultant will also inform the GP if the patient is discharged prior to screening taking place (8 weeks after exposure)</td>
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<tr>
<td><strong>Crockery/ Cutlery</strong></td>
<td>No special requirements.</td>
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<tr>
<td><strong>Discharge Planning</strong></td>
<td>A treatment plan must, prior to discharge, be agreed between, and known to, patient, patient’s family, other care providers and any other relevant person. Arrangements must be in place for accommodation, necessary support, and supervision of therapy. <strong>Treatment plan to include:</strong> accommodation (availability and suitability), assessment of risk of those at home, supervision of therapy, arrangements for further tests and hospital visits, transport for visits, assessment and referral for support services required. A person will be designated responsible for ensuring the plan is carried out and who is to be contacted if the plan is not adhered to. (Relevant people may include: the patient, close relatives/ friends, TB Liaison Nurse and Physician, named Nurse, District Nurse, Social Worker, Home Support Team, General Practitioner.) If the patient self-discharges or absconds from the ward and is still</td>
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</table>
considered to be an infection risk contact the CPHM via 0141 201 4917 (64917). The TB Liaison nurse should also be informed

Tuberculosis treatment for an appropriate duration of therapy to be dispensed on discharge, this may be longer than the standard week depending on social circumstances.

**Drug Resistance**

All patients with or suspected of having TB must be assessed for risk of drug resistance. This is done by identifying on admission if the patient has had:

- previous treatment for tuberculosis,
- previous history of poor compliance with TB treatment
- contact with a person with known drug resistant disease
- History of travel to a country with high risk of MDR-TB
- Residence in London
- Age profile, with highest rates between ages 25 – 44
- Male gender

and during therapy monitoring for:

- failure of clinical response, e.g. temperature remains elevated after 4 months.

If the patient is suspected of having MDR-TB then until confirmed otherwise the procedures for multi-drug resistance will be followed.

**MDR – TB** TB that is resistant to at least isoniazid and rifampicin

**XDR – TB** TB that is resistant to isoniazid, rifampicin, a fluoroquinolone and either amikacin, capreomycin or kanamycin.

**Equipment**

No special requirements provided equipment is decontaminated as per the NHSGGC Decontamination Policy.

**Exposures**

The primary measure to reduce exposure in healthcare settings are; early diagnosis, early isolation, appropriate application of TBPs and early commencement of appropriate therapy.

All HCWs who have been involved in the care of a sputum smear positive patient with pulmonary Tuberculosis prior to infection control precautions being instigated who have had 8 or more hours close contact with the index case, or who are immunocompromised will be referred to the Occupational Health Service (OHS). Children with TB are
### Hand Hygiene
See NHSGGC Hand Hygiene Policy.

### Last Offices
Special precautions are required for Last Offices. See NHSGGC SOP for Last Offices.

### Moving between wards, hospitals and departments (including theatres)
If possible avoid unnecessary movement of patient until therapy has been established. If movement is necessary, for smear positive adult patients within the first 14 days of therapy, ask the patient to wear a mask when out of room and until returned to isolation – a surgical mask is sufficient for this purpose.

Notify the receiving department, especially Endoscopy, theatres and the ambulance service.

### Notice for Door
Yes. NB Keep door closed until restrictions are lifted.

### Outbreak
Unlikely in hospital settings provided infection control precautions are followed.

### Patient Clothing
No special requirements. Advise relatives that there is no risk from washing the patient’s clothes at home.

### Patient Information
The TB Liaison Nurse will take a leading role in advising and informing the patient and his contacts in the community for the duration of treatment. The patient/ parent/ guardian/ next-of-kin (as appropriate) will be informed of the patient’s condition and the necessary precautions. Any questions and concerns they may have will be answered.

### Personal Protective Equipment (PPE)
HCWs caring for patients with TB should follow Standard Infection Control Precautions (SICPs) in addition to this FPP3 masks should be worn if:

- MDR TB is suspected or confirmed
- Aerosol generating procedures, e.g. bronchoscopy, sputum induction are being performed
- HCWs are caring for any patient requiring regular or prolonged contact. (8 or more hours cumulative)

### Precautions Required Until
**Smear positive not MDR:**
- had a minimum of 14 days appropriate therapy, which has been...
### STANDARD OPERATING PROCEDURE (SOP)

**TBerculosis**

*(Including Multi-Drug Resistant TB)  
Transmission Based Precautions*

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**Effective From:**
July 2015

**Review date:**
July 2017

**Version:**
4

The most up-to-date version of this SOP can be viewed at the following website:

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<table>
<thead>
<tr>
<th>Procedure Restrictions</th>
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<tbody>
<tr>
<td>• Never undertake sputum induction in the main ward.</td>
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<tr>
<td>• If TB is suspected, or less than 14 days of therapy in a confirmed case, cough inducing procedures e.g. bronchoscopy should be avoided if possible.</td>
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<tr>
<td>• Cough inducing procedures should be undertaken by HCWs wearing respiratory protection masks (FFP3) in a negatively-pressurised room. The doors should remain closed for the duration of the procedure.</td>
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<tr>
<td>• Patient procedures to reduce aerosolisation of droplet nuclei:</td>
</tr>
<tr>
<td>o patients should be taught to cover both the nose and mouth with a tissue whenever they cough or sneeze;</td>
</tr>
<tr>
<td>o As an increasing number of immunocompromised patients are being managed in hospital, in-patients with smear positive respiratory TB should be asked (with explanation) to wear surgical masks whenever they leave their room until they have had 14 days of appropriate tolerated drug treatment.</td>
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<tr>
<th>Referral</th>
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<tr>
<td>All patients suspected of having TB should be referred to a Respiratory Physician or Infectious Diseases Physician before commencing TB treatment. Microbiologist to inform the clinician by telephone of the</td>
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</table>
### Risk assessment required

A risk assessment is required of all patients for TB and of all TB patients for possible drug resistance.

### Screening on Admission

Any patient with an unexplained cough lasting more than three weeks, with or without weight loss, anorexia, fever, night sweats or haemoptysis should have three separate sputum samples sent to the laboratory and a chest X-Ray. These specimens should be marked ‘URGENT’ and AAFB requested in addition to culture. Patients whose history is indicative of tuberculosis on admission should be isolated as stated in the Accommodation section.

### Terminal Cleaning of Room

Follow NHSGGC SOP for [Terminal Clean of Isolation Rooms](#).

### Visitors

Restrict visitors to those contacts who have visited the patient prior to hospitalisation until 14 days after therapy has commenced and tolerated.

If visitors are unwell or have symptoms of TB, they should not visit until assessed by the TB liaison nurse. Those who are immunocompromised should not visit. Visitors should only visit the patient with TB and not other patients. Parents and guardians of children with TB must be assessed if visiting in hospital.
3. Evidence Base

Immunisation against infectious disease ‘Green Book’ Department of Health. 


HPS (2014) Transmission Based Precautions Literature Review: Respiratory Protective Equipment (RPE) 
4. Glossary

<table>
<thead>
<tr>
<th>Aerosol Generating Procedures</th>
<th>During certain healthcare procedures, small particle aerosols may be generated which could increase the risks to HCWs in the immediate vicinity. These aerosol generating procedures include:</th>
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<tbody>
<tr>
<td>• Intubation, extubation and related procedures, e.g. manual ventilation and open suctioning.</td>
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<td>• Cardiopulmonary resuscitation.</td>
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<td>• Induction of sputum</td>
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<tr>
<td>• Bronchoscopy.</td>
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<td>• Positive pressure ventilation via face mask, e.g. BiPAP, CPAP</td>
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<td>• High frequency oscillating ventilation</td>
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<tr>
<td>• Some Dental procedures (e.g. drilling)</td>
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<tr>
<td>• Surgery and post mortem procedures in which high speed devices are used</td>
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| ESMI | Enhanced Surveillance of Mycobacterial Infection |
| HPS | Health Protection Scotland |