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### SOP Objective

To ensure that patients suspected of or confirmed to have tuberculosis are diagnosed and treated promptly and their contacts followed-up to minimise the risk of cross-infection and 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

- Link to fit testing information inserted
- Removed additional information
- Additional wording in contact tracing section


Approved by and date	Board Infection Control Committee 29 <sup>th</sup> July 2019
Date of Publication	2 <sup>nd</sup> August 2019
Developed by	Infection Control Policy Sub-Group
Related Documents	NHSGGC Hand Hygiene SOP National Infection Control Manual (SICPs)
Distribution/ Availability	NHSGGC Infection Prevention and Control Policy Manual and the Internet <a href="http://www.nhsggc.org.uk/your-health/public-health/infection-prevention-and-control/">www.nhsggc.org.uk/your-health/public-health/infection-prevention-and-control/</a>
Lead Manager	Board Infection Control Manager
Responsible Director	Board Medical Director

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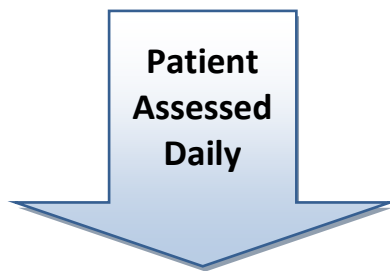
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## Appendix 1 – Pulmonary TB Aide Memoire

**Consult SOP and isolate in a single room with:**

- ✓ ensuite / own commode
- ✓ door closed
- ✓ IPC yellow sign on door
- ✓ dedicated equipment
- ✓ **Care Checklist** completed daily



Patient has received 14 days of appropriate antibiotics and tolerated this.  
If (MDR / XDR TB continue isolation until discharge).



- ✓ Undertake terminal clean of room
- ✓ Stop isolation

**SOP - Guidelines for patients in isolation:**

**Hand Hygiene:** Liquid Soap and Water or alcohol hand gel on clean hands

**PPE:** FFP3 mask, disposable yellow apron and gloves for all routine care and Aerosol Generating Procedures. (AGPs). Eye protection where there is a risk of splashing of blood and body fluids.

**Patient Environment:** Twice daily chlorine clean

**Patient Equipment:** Twice daily chlorine clean

**Laundry:** Treat as infected


**Waste:** Dispose of as Clinical / Healthcare waste

**Incubation Period:** 2-8 weeks to cause an immune reaction (may be years before disease develops)

**Period of communicability:** n/a

**Notifiable disease:** Yes

**Transmission Route:** Airborne

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## 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 policy 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 policy.
- 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.
- If HCW unable to follow this SOP, IPCT will support staff to carry out a risk assessment

### Clinicians must:

- Notify Public Health of any newly diagnosed patient.
- Notify the TB Liaison Nurse of any newly diagnosed patients.
- Assess inpatient contacts of smear positive patients and liaise with GP and TB liaison

### TB Liaison Nurse:


- Liaise with Clinicians, Infection Control 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 and arrange appropriate screening as required.

## 2. General Information on Tuberculosis


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/](http://www.nhsggc.org.uk/your-health/public-health/infection-prevention-and-control/)

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<b>Communicable Disease/ Alert Organism</b>	Tuberculosis is a disease caused by infection with the <i>Mycobacterium tuberculosis</i> complex of organisms ( <i>M. tuberculosis</i> , <i>M. Bovis</i> , <i>M. Africanum</i> and <i>M. Micoti</i> ) which may cause pulmonary and/ or non-pulmonary tuberculosis.
<b>Clinical Condition(s)</b>	Pulmonary and laryngeal TB both require the respiratory precautions set out in this SOP. From this point both these forms of TB will be referred to as pulmonary TB For respiratory granuloma without cavity standard infection control precautions are recommended.
<b>Definitions</b>	<u>TB Infection</u> : defined as the bacteria having caused an immune reaction with no evidence of disease. <u>TB Disease</u> : the patient has symptoms or clinical evidence of disease.  Sputum smear positive = infectious Sputum smear negative = low infectivity risk
<b>Mode of Spread</b>	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.
<b>Incubation period</b>	2-8 weeks to cause an immune reaction. May be many years before disease develops.
<b>Notifiable disease</b>	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. <b>NB</b> notification (not confirmed) is on suspicion – usually considered to be equivalent to initiation of therapy. Telephone PHPU - 0141 201 4917 (64917)
<b>Persons most at Risk</b>	<ul style="list-style-type: none"> <li>Individuals whose cumulative exposure time is more than 8 hours to a sputum smear positive patient.</li> <li>Those who have immunodeficiency for any reason.</li> </ul>

### 3. Transmission Based Precautions


The most up-to-date version of this SOP can be viewed at the following website:  
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<b>Accommodation</b>	<ul style="list-style-type: none"> <li>• <b>Suspected TB:</b> single-room is required for all patients thought to have pulmonary tuberculosis until the patient has 3 smear negative sputum/bronchial alveolar lavage specimens or in the case of a child, negative gastric washings.</li> <li>• <b>Sputum smear positive TB:</b> if possible, place patient in a negative pressure single room (where available) until 14 days of appropriate tolerated drug treatment and definite clinical improvement, i.e. absence of cough. The patient may be discharged before the 14 days.</li> <li>• <b>Confirmed Multi-Drug Resistant TB:</b> 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, XDR- TB) until discharge from hospital.</li> </ul> <p>Patients who have had sputum smear positive TB and have had 14 days adequate therapy and are improved must <b>not</b> on release from isolation be placed next to HIV positive or other immunocompromised patients, if remaining in hospital. Where possible they should be on a separate ward from such patients.</p> <p><b>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. The risk assessment should be documented and reviewed daily.</b></p> <ul style="list-style-type: none"> <li>• If XDR TB/MDR TB, isolations should continue until discharge.</li> </ul>
<b>Care Checklist available</b>	Yes.
<b>Clinical / Healthcare Waste</b>	Waste should be designated as clinical/ healthcare waste and placed In an orange bag. Please refer to the NHSGCC <a href="#">Waste Management Policy</a> .


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<b>Contact tracing</b>	<p>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;8hours close contact with a sputum smear positive patient). In paediatrics resident parents/ guardians must be assessed.</p> <p>For hospital patient contacts, the clinician in charge of the patient must ensure follow up with the patients either via their GP or with the assistance of the HPN/TB liaison. Any hospital patient contacts will also be informed of any relevant subsequent action. The Immediate Discharge Letter must be completed at the time of discharge and include details of planned screening and follow up after discussion with the TB liaison nurse.(8 weeks after exposure)</p>
<b>Discharge Planning</b>	<p>A treatment plan and follow up must be arranged prior to discharge and discussed with TB liaison and any relevant carers. Arrangements must be in place for accommodation, necessary support, and supervision of therapy. It is important to communicate the infectious status of the patient to clinical teams and precautions required when arranging follow up clinic or community visits.</p> <p>If the patient self-discharges or absconds from the ward and is still considered to be an infection risk contact the CPHM via 0141 201 4917 (64917). The TB Liaison nurse should also be informed</p>
<b>Drug Resistance</b>	<p>All patients with, or suspected of having TB must be assessed for risk of drug resistance by a respiratory /ID consultant. This is done by identifying on admission if the patient has had:</p> <ul style="list-style-type: none"> <li>• previous treatment for tuberculosis,</li> <li>• previous history of poor compliance with TB treatment</li> <li>• contact with a person with known drug resistant disease</li> <li>• History of travel to a country with high risk of MDR TB  <a href="http://www.who.int/tb/publications/global_report/en/">http://www.who.int/tb/publications/global_report/en/</a> </li> </ul> <p>Discuss with microbiology about rapid molecular testing and fast track of samples to the TB reference lab and during therapy monitoring for:</p> <ul style="list-style-type: none"> <li>• Failure of clinical response, e.g. temperature remains elevated after 4 months.</li> </ul> <p>If the patient is suspected of having MDRTB then until confirmed otherwise the procedures for multi-drug resistance will be followed.</p>


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	<p><b>MDR TB</b> - TB that is resistant to at least isoniazid and rifampicin</p> <p><b>XDR TB</b> - TB that is resistant to isoniazid, rifampicin, a fluoroquinolone and either amikacin, capreomycin or kanamycin.</p>
<b>Equipment</b>	No special requirements provided equipment is decontaminated as per the NHSGGC <a href="#">Decontamination Policy</a> .
<b>Exposures</b>	<p>The primary measure to reduce exposure in healthcare settings are; early diagnosis, early isolation, appropriate application of TBPs and early commencement of appropriate therapy.</p> <p>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).</p>
<b>Hand Hygiene</b>	See NHSGGC <a href="#">Hand Hygiene SOP</a> .
<b>Last Offices</b>	Special precautions are required for Last Offices. See National guidance for <a href="#">Last Offices</a> .
<b>Moving between wards, hospitals and departments (including theatres)</b>	<p>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 fluid repellent surgical mask.</p> <p>Notify the receiving department.</p>
<b>Notice for Door</b>	Yes, if patient is isolated a yellow IPC sign should be placed on door. <b>NB</b> Keep door closed until restrictions are lifted.
<b>Outbreak</b>	Unlikely in hospital settings provided infection control precautions are followed.
<b>Patient Clothing</b>	No special requirements. Advise relatives that there is no risk from washing the patient's clothes at home. See <a href="#">NHSGGC Patient Information Leaflet on washing clothes at home</a> .




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<b>Personal Protective Equipment (PPE)</b>	<p>HCWs caring for patients with <b>suspected of or confirmed</b> (sputum smear positive) <b>tuberculosis</b>, a yellow disposable apron, disposable gloves and an FFP3 mask must be worn for both routine care and when undertaking aerosol generating procedures (AGP). Where there is an identified risk of splashing of blood and or body fluids into the mucous membranes of the eyes, suitable eye protection must also be worn. All PPE should be kept on for up to 2 hours after an AGP if remaining in the patient’s room, and FFP3 mask should be removed outside the room.</p> <p>For full list of AGPs see section 4</p> <p><b>For suspected and confirmed MDR TB/ XDRTB:</b></p> <p>PPE should be worn as above.</p> <p><a href="http://www.staffnet.ggc.scot.nhs.uk/Info%20Centre/Health%20and%20Safety/Corporate%20Health%20and%20Safety/Documents/COSHH/NHSGGC%20HS%20Guidance%20on%20FFP3%20Use.docx">http://www.staffnet.ggc.scot.nhs.uk/Info%20Centre/Health%20and%20Safety/Corporate%20Health%20and%20Safety/Documents/COSHH/NHSGGC%20HS%20Guidance%20on%20FFP3%20Use.docx</a></p>
<b>Precautions Required Until</b>	<p><b>Sputum Smear positive not MDR TB / XDR TB:</b></p> <ul style="list-style-type: none"> <li>• had a minimum of 14 days appropriate therapy, which has been tolerated e.g. no diarrhoea or vomiting and patient has been fully compliant</li> <li>• Definite clinical improvement as a response to therapy, e.g. cessation of cough</li> </ul> <p>Seek the advice of a member of the IPCT before removing a patient from isolation. Once removed from isolation keep the patient under review. Return to isolation if they deteriorate clinically.</p> <p><b>Pulmonary MDR TB:</b> For duration of stay</p> <p><b>Pulmonary XDR TB:</b> For duration of stay</p> <p>Discuss all cases of MDR or XDR TB with infection specialist / ICD.</p> <p><b>Smear negative / Suspected TB:</b> Three separately taken microscopy sputum smears /gastric washings. (ideally early morning and taken on consecutive days). Samples should be sent for both <u>smear</u> and <u>culture</u></p> <p><b>Extra-pulmonary TB:</b> Pulmonary disease must be excluded before transmission based precautions are stopped. Unless TB lesions draining, in which case SICPs should be followed.</p>

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<b>Procedure Restrictions</b>	<ul style="list-style-type: none"> <li>Sputum and cough inducing procedures should be undertaken by HCWs wearing full PPE as above in a single / negatively-pressurised room with the door closed. HCW should continue to wear their PPE for up to 2 hours following an AGP. Each area will differ depending on air exchanges. Discuss with ICD if not known.</li> <li>Patient procedures to reduce aerosolisation of droplet nuclei: patients should be taught to cover both the nose and mouth with a tissue whenever they cough or sneeze;</li> <li>In-patients should be asked to wear fluid repellent surgical masks if they are required to leave their room, until they have had 14 days of appropriate tolerated drug treatment and shown clinical improvement.</li> <li>Bronchoscopy's in those suspected of Pulmonary TB should be done last with adequate ventilation as above. Bronchoscopy suites managers should be aware of the number of air exchanges and the duration of time required before staff and other patients can re-enter the area.</li> </ul>
<b>Referral</b>	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 positive smear results.
<b>Risk assessment</b>	<ul style="list-style-type: none"> <li>For patients with extra-pulmonary disease the transmission based precautions in this SOP must be followed until pulmonary involvement can be ruled out.</li> <li>Young children are broadly considered to be paucibacillary and unlikely to be of high infectivity risk. TBP in paediatric inpatients will require a case by case risk assessment.</li> </ul>
<b>Screening on Admission</b>	Pulmonary tuberculosis should be considered in any patient with an unexplained cough lasting more than three weeks, with or without weight loss, anorexia, fever, night sweats or haemoptysis. They should usually 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 pulmonary tuberculosis on admission should be isolated as stated in the <i>Accommodation</i> section.
<b>Terminal Cleaning of Room</b>	Follow NHSGGC SOP for <a href="#">Terminal Clean of Isolation Rooms</a> .

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<b>Visitors</b>	<p>Restrict visitors to contacts who have visited the patient prior to hospitalisation until 14 days after therapy has commenced and tolerated. Children should not be allowed to visit unless exceptional circumstances.</p> <p>Visitors who do not fit the criteria of household contacts should not visit unless under exceptional circumstances when consideration of fit testing should be undertaken.</p> <p><b>Paediatric patients:</b> It is important to make sure that parents/carers are not themselves infectious with Tb before allowing them to visit/stay in hospital with the child.</p> <p>In the case of suspected or proven pulmonary MDR or XDR TB a plan for visiting should be discussed with the local IPCT in the first instance. 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.</p>
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#### 4. Evidence Base

Immunisation against infectious disease 'Green Book' Department of Health.  
<https://www.gov.uk/government/collections/immunisation-against-infectious-disease-the-green-book>

HPS (2017) Transmission Based Precautions Literature Review: Respiratory Protective Equipment (RPE)  
<http://www.nipcm.hps.scot.nhs.uk/documents/tbp-respiratory-protective-equipment-rpe/>

NICE Guidance (NG 33) 2016  
<https://www.nice.org.uk/guidance/NG33/NG33>

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## 5. List of AGPs

Aerosol Generating Procedures	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: <ul style="list-style-type: none"> <li>• Intubation, extubation and related procedures, e.g. manual ventilation and open suctioning.</li> <li>• Cardiopulmonary resuscitation.</li> <li>• Induction of sputum</li> <li>• Bronchoscopy.</li> <li>• Positive pressure ventilation via face mask, e.g. BiPAP, CPAP</li> <li>• High frequency oscillating ventilation</li> <li>• Some Dental procedures (e.g. drilling)</li> <li>• Surgery and post mortem procedures in which high speed devices are used</li> </ul>
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