

Other

NATIONAL TUBERCULOSIS ADVISORY COMMITTEE GUIDELINE: MANAGEMENT OF TUBERCULOSIS RISK IN HEALTHCARE WORKERS IN AUSTRALIA

Justin Waring and the National Tuberculosis Advisory Committee

Introduction

Tuberculosis (TB) is uncommon in Australia and not commonly managed by most healthcare workers (HCWs). However, even in a low incidence setting, occasional exposure of HCWs is inevitable and transmission of TB to HCWs leading to disease does occur. In addition, HCWs may have been recruited to Australia from countries with high TB incidence. These HCWs are more likely to be infected with TB before arrival and subsequently develop active disease while working in health settings in Australia. In 2001, there were 20 TB notifications in HCWs in Australia, of which 10 were born overseas, whereas in 2013, 70 of 77 notified cases (91%) were people born overseas.^{1,2}

Managing the risk of TB in HCWs is multifaceted. A combination of staff education, awareness, early diagnosis, appropriate use of personal protective equipment (PPE), environmental controls and screening procedures is required to minimise the risk of transmission to HCWs and from HCWs to patients. Prevention of nosocomial transmission from HCWs is particularly important in patients that are more vulnerable, for example children and the immunocompromised. This document aims to describe the components that are considered essential for all healthcare facilities in Australia to minimise this risk. It is not intended to be operational, and reference should be made to specific state and territory TB Control Program policies for this detail. Each facility should develop its own policy for the management of TB risk in HCWs according to this jurisdictional policy and the facility specific factors that determine risk, but it should include at least the following components.

Components

1. Pre-employment Screening

Healthcare facilities are responsible for providing assessment and screening services including a test for latent tuberculosis infection (LTBI), chest x-ray

and appropriate referral processes for the interpretation and follow-up of such test results in partnership with jurisdictional TB control programs. Assessment and screening must be undertaken by clinicians trained in TB. Screening should include students undertaking placement at a healthcare facility, locums and agency staff.

The rationale for pre-employment screening determines who is tested and the action taken from results. The rationale is threefold:

- a. obtaining a baseline test result in case of future testing after exposure at work;
- b. identifying LTBI in HCWs that warrants preventive therapy; and
- c. identifying active TB in HCWs.

Pre-employment screening involves a risk assessment in all HCWs. There are two elements of this risk assessment:

- a. An estimate of the probability of future TB exposure.
This is determined by the historical incidence of TB in the facility and the specific work place of the HCW.
- b. The pre-test risk of LTBI.

This can be broadly categorised as high or low based on risk factors for LTBI. Specifically a new employee has a “high” risk for LTBI if:

- i. born, or worked for more than 3 months, in a country with higher TB incidence.
This is arbitrarily set at an incidence rate of greater than 40 per 100,000*; or
- ii. known past history of contact with TB

* TB incidence rates by country can be obtained from <http://www.who.int/tb/country/data/profiles/en/>. It is noted that 40/100,000 is a lower threshold than that adopted in some settings, but considered appropriate here because of the higher risk of exposure in HCWs as compared to the general population.

(work or personal).

Based on this risk assessment some HCWs should have a test for LTBI. Note, all HCWs should be screened (i.e. undergo the above risk assessment), but only some of these HCWs should be required to have a diagnostic test. The HCWs that are tested, in general, are those that may come into contact with TB (establishing a baseline) and those with a high pre-test risk for LTBI (preventive therapy may be recommended). Within these parameters the extent of testing and the action taken for a positive result varies between jurisdictions, and reference should be made to specific state and territory TB control program policies for guidance on this. For further The National Tuberculosis Advisory Committee (NTAC) guidance on LTBI treatment in Australia, refer to the “National Position Statement for the Management of Latent Tuberculosis Infection”. It is important that screening test results are formally recorded and permanently retained for future reference.

HCWs requiring a screening test for LTBI can have a tuberculin skin test (TST) or an interferon gamma release assay (IGRA, such as the QuantiFERON-TB Gold assay, Cellestis/Qiagen, Carnegie, Australia). IGRAs offer the advantages of improved specificity in a low prevalence setting, a lack of a booster effect with repeated testing and the convenience of a blood test. However, problems with interpretation of results near the cut-off and what determines a conversion, as well as the expense of the test, are disadvantages of IGRAs. For HCWs that undergo routine recurrent testing (see Component 3 below) the choice of test remains controversial.³ High rates of conversions and reversions have been reported leading to more costly follow-up of screen-positive subjects.^{4, 5} These conversions and reversions tend to occur more frequently when the initial IGRA result is close to the cut-off (0.35 IU/ml). NTAC recommends that either a TST or an IGRA are suitable as a single screening test, apart from when a HCW is likely to undergo serial testing. In these HCWs the preferred test is a TST and the role of IGRAs should be limited to supplementary testing to improve specificity.⁶

When a HCW does not undertake a screening test, the reason for this should be recorded and the HCW should be counselled about prompt presentation with symptoms suggestive of active TB. This may occur because the screening is not warranted e.g. a history of active TB or documentation of a prior positive screening test. Alternatively, HCWs that do not consent to a screening test that is recommended should be advised of the potential risks involved and should acknowledge in writing their non-participation.

Pre-employment screening for active TB should be considered in HCWs with a high pre-test risk for LTBI, especially if a pre-employment test for LTBI is positive. This includes a symptom screen and chest x-ray.

HCWs with a positive pre-employment screening test for LTBI should be considered for preventive therapy, in consultation with a physician with expertise in TB medicine. For further NTAC guidance on LTBI treatment in Australia, refer to the “National Position Statement for the Management of Latent Tuberculosis Infection”. HCWs who do not take preventive therapy may also be considered for follow up surveillance for active TB, especially if they have recently arrived from a country with high TB incidence (see definition above). This is to detect TB reactivation early, and usually involves periodic symptom screening and a chest x-ray for 2 years.

Prospective HCWs that are identified in pre-employment screening to be immunocompromised should have their work position carefully assessed and, if necessary, modified to avoid potential exposure to TB.

2. Post Exposure Contact Tracing

Contact tracing amongst HCWs that are exposed to TB through the course of their work should be undertaken according to usual contact tracing principles and practices. In particular, reference should be made to the Series of National Guidelines (SoNG) for the Public Health Management of TB and relevant state or territory TB control program policies.⁷

The extent of post exposure testing of HCWs, in general, depends on the degree to which the index case was isolated (i.e. whether in a single room and the ventilation characteristics of the room), the estimated level of infectiousness of the index case and the amount of contact that the HCW has with the index case.

Post exposure testing for LTBI should use the same test for LTBI (TST or IGRA) as was used for the pre-employment screening test. Reference to the pre-employment or “baseline” result aids interpretation of the post exposure result by more clearly determining if conversion, and therefore new infection, has occurred.

In contact tracing of HCWs there are a number of special considerations including:

- a. anxiety and unfounded fears are just as common even though HCWs may be better educated in respect to TB, so clear and

- prompt communication is essential;
- b. publicity and media attention are possible and should be prepared for, including informing senior health executives; and
- c. maintaining the confidentiality of the identity and medical record of the index case and HCWs affected is essential.

3. Routine Recurrent Screening

The pre-employment screening test for LTBI can be repeated at pre-determined routine intervals that are not dictated by episodes of exposure. The aim of this recurrent or serial testing is to detect conversion that would have otherwise been unrecognised. In addition to being of potential benefit to the HCW, the results act as a surveillance of undetected transmission of TB that may be occurring in the health facility.

Recurrent screening is not recommended for all HCWs. It should be considered in a HCW with a negative pre-employment test who works in an area of high potential risk of exposure to TB. These occupations will be specified at a jurisdictional level, but may include workers in TB clinics, respiratory and infectious disease departments, mycobacterial laboratories, bronchoscopy and induced sputum suites, and mortuaries.

Serial testing should use the same test for LTBI used at baseline screening (TST or IGRA) so that conversion, indicating recent infection, can be appropriately recognised. The previously mentioned concerns around the definition of conversion in an IGRA should be borne in mind. A positive result, indicating conversion, should prompt a recommendation of preventive therapy. If a HCW declines preventive therapy after a serial LTBI test is positive, the follow up periodic clinical review and chest x-ray described in Component 1 above is more strongly indicated, because of the higher risk of reactivation after recent infection.

HCWs who work in these high risk areas and have a positive preemployment screening test can be considered for chest x-ray and clinical review. The interval period for recurrent screening is usually, but arbitrarily, set at one year.

4. Active TB in HCWs

HCWs diagnosed with active TB are managed as for other cases of active TB. However, special considerations include:

- a. informed consent should be obtained from the HCW before information about the

- diagnosis is disclosed to the employer; and
- b. if pulmonary TB is diagnosed, the HCW should be excluded from work until the treating physician has determined that adequate treatment has been taken to ensure the HCW is no longer infectious.

In respect to this, additional caution may be required if the HCW works with vulnerable patients e.g. the immunocompromised or children.

5. Surveillance

Monitoring of recurrent screening test conversions (see Component 3) and the incidence of active TB in HCWs in a healthcare facility can be important indicators of TB transmission risk and adequacy of infection control practice. In a HCW with active TB, identifying nosocomial transmission (HCW to patient or vice-a-versa) by analysis of genetic typing of the TB isolates (e.g. VNTR/MIRU typing) is particularly important, and if it occurs should be reported to the jurisdictional TB Control Program.

6. BCG Vaccination

BCG vaccination is not routinely recommended for HCWs in Australia.^{8,9} BCG vaccination can occasionally be considered in HCWs that are at high risk of exposure to multi-drug resistant TB (MDR-TB) e.g. mycobacterial laboratory workers, those going to work in high MDR-TB prevalence settings.

7. Education

In healthcare settings with a low TB incidence, such as in Australia, experience with TB is often limited, but an enhanced awareness of the risks of infection transmission and sentinel symptoms is important. A program of regular education of HCWs is intended to ensure early detection of cases, appropriate infection control practices and early presentation for diagnosis if the HCW has symptoms suspicious of TB. Emphasis should be on the fact that the most effective way to control TB is early detection and commencement of treatment.

Healthcare Facility Protection of HCWs

Management of patients with TB

Management of the risk presented to HCWs by patients with TB is outlined in the NTAC *Infection Control Guidelines for the Management of Patients with Suspected or Confirmed Pulmonary Tuberculosis in Healthcare Settings*.¹⁰ Each health-

care facility should write and periodically review a TB Infection Control Policy with reference to these guidelines and local jurisdictional policy, and ensure that all HCWs are updated on current policy. These guidelines include recommendations for airborne infection control precautions, engineering controls for infection control and the use of personal protective equipment. In addition, facilities that are likely to have patients presenting with TB should have protocols to ensure the rapid detection, isolation and treatment of patients with infectious TB.

Management of TB transmission risk in the laboratory

Infection control practices aimed at preventing transmission to HCWs working in mycobacterial laboratories are described in the NTAC *Guidelines for Australian Mycobacteriology Laboratories*.¹¹

Jurisdictional Contacts

Specific state and territory TB control programs should be contacted to obtain operational policies regarding management of TB risk in HCWs.

Australian Capital Territory

Department of Respiratory and Sleep Medicine
Canberra Hospital & Health Service
Yamba Drive, Garran, Australian Capital Territory 2605
T: 02 6244 2066
Policy: *Occupational Assessment, Screening and Vaccination*.

New South Wales

NSW TB Program
Health Protection NSW
T: 02 9391 9277
Policy: Occupational Assessment, Screening and Vaccination Against Specified Infectious Diseases (<http://www.health.nsw.gov.au/Infectious/tuberculosis/Pages/Policies.aspx>).

Northern Territory

TB Chest Clinic
Centre of Disease Control
Department of Health, Northern Territory
T: 08 89228044
F: 08 89228310
Policy: Guidelines for the Control of Tuberculosis in the Northern Territory

Queensland

Communicable Diseases and Infection Management Unit

Communicable Diseases Branch
Department of Health, Queensland
T: 07 33289724
Policy: Health Service Directive – Tuberculosis Control Protocol for the Control of Tuberculosis (<https://www.health.qld.gov.au/directives/docs/ptl/qh-hsdptl-040-1.pdf>)

South Australia

South Australia Tuberculosis Service
275 North Terrace, Adelaide, South Australia, 5000
T: 08 8222 4867
Policy: *Control of Tuberculosis in South Australian Health Services Directive*

Tasmania

Director Workplace Health and Wellbeing
Tasmanian Health Service - Southern Region
Ground Floor, 56 Collins Street, Hobart, Tasmania, 7000
T: 03 6166 6883
F: 03 6166 7516

or

Communicable Disease Prevention Unit
Public Health Services, [Department of Health and Human Services](#)
GPO Box 125, 25 Argyle Street, Hobart, Tasmania, 7001
T: 03 6166 0702
F: 03 6222 7744
Tasmanian Health Organisation – South Policy: *Immunisation Protocol for Health Care Workers (HR-58)*

Tasmanian Health Organisation – North Policy: *THO-North Employee Screening & Immunisation (January 2015)*

Tasmanian Health Organisation – North West Policy: *Occupational Assessment, Screening and Immunisation Protocol (November 2013)*

Victoria

Victorian Tuberculosis Program
Peter Doherty Institute for Infection and Immunity
792 Elizabeth Street, Melbourne, Victoria
General Enquiries: 03 9342 9478
Public Health Nurse Manager: 03 9342 9475
Email: vtpadmin@mh.org.au
Policy: Victorian TB Guidelines (“Management, control and prevention of tuberculosis” www.thermh.org.au/health-professionals/clinical-services/victorian-tuberculosis-program)

Western Australia

Anita Clayton Centre
 1/311 Wellington Street, Perth, Western Australia
 T: 08 9222 8500
 F: 08 9222 8501
 Email: ACCAdmin@health.wa.gov.au
 Policy: *Policy 6.3 TB and Health Care Workers*

Acknowledgements

The author would like to acknowledge the National Tuberculosis Advisory Committee members both past and present (in alphabetical order): Associate Professor Anthony Allworth, Dr Ral Antic, Dr Ivan Bastian, Mr Philip Clift, Dr Jo Cochrane, Dr Chris Coulter (Chair), Dr Paul Douglas, Associate Professor Justin Denholm, Dr Steve Graham, Dr Jennie Hood, Clinical Associate Professor Mark Hurwitz, Dr Vicki Krause, Mr Chris Lowbridge, Associate Professor Ben Marais, Ms Rhonda Owen, Ms Tracie Reinten, Dr Richard Stapledon, Dr David Stock, Dr Brett Sutton, Ms Cindy Toms, Mr Peter Trevan, Dr Justin Waring; with Dr Anna Colwell (Medical Advisor), and the NTAC Secretariat from the Department of Health.

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