Tuberculosis prevention and screening

About a quarter of the global population is estimated to have been infected with TB bacteria. About 5–10% of people infected with TB will eventually get symptoms and develop TB disease. Those who are infected but not (yet) ill (latent TB infection - LTBI) cannot transmit it.[1]

Preventing transmission of tuberculosis (TB), contact tracing, screening and bacillus Calmette-Guérin (BCG) vaccination are key targets in TB prevention. Although the routine BCG vaccination of all children was discontinued in the UK in 2005, it has been replaced by a TB risk-based programme. It targets contacts of any known TB cases and those children at most risk of exposure to TB, particularly from the more serious childhood forms of the disease.[2] [3]

See the article on BCG Vaccination for further information.

Whom to screen[4]

Asymptomatic people who are at high risk of infection should be screened for tuberculosis (TB) through active case-finding. Targeted screening programmes may be co-ordinated by local multidisciplinary TB teams in high prevalence settings of under-served groups, such as in prisons, homeless hostels or shelters, or substance misuse services; and in high-prevalence parts of the UK, such as London or Birmingham.

- People who have been in contact with a person with active pulmonary or laryngeal TB should have screening for latent TB arranged through the local multidisciplinary TB team. High-risk contacts who need contact tracing include:
    - All household members.
    - Close contacts (eg, partner, house visitors, and close workplace contacts) if the person with TB has a positive sputum smear result.
    - Casual contacts (eg, most work colleagues) if the index person with TB is particularly infectious (known transmission to close contacts), or if casual contacts are at increased risk of infection (eg, immunocompromised people).
- People who are immunocompromised at high risk for latent TB infection (eg, severely immunocompromised with HIV or following solid organ or allogeneic stem cell transplant) should have screening for latent TB following a risk assessment.
    - People starting specialist biologic drug treatment for inflammatory conditions with anti-tumour necrosis factor (TNF)-alpha agents such as infliximab, should be screened for active and latent TB before treatment is started.
    - People on biologic treatment should be monitored for TB before, during, and after treatment.
- People resident in a country with high TB prevalence applying for a UK visa for more than 6 months are required to have pre-entry screening for active TB in their country of origin in a Home Office-approved clinic. For people who are new entrants to the UK from a high TB prevalence country who present to healthcare services and have not had pre-entry screening, arrange referral to the local multidisciplinary TB team.
- People who are new NHS employees who will be working with patients or clinical specimens should not start work until they have completed a TB screen or health check. This will usually be arranged by the Occupational Health department.

- For people who have evidence of TB scarring or untreated fibrotic changes on chest X-ray but have not completed treatment as planned, arrange urgent referral to the local multidisciplinary TB team for further assessment and management.

Which test to use[3]

The results of screening tests to identify latent TB should be interpreted taking into account the person's immune status, history of exposure to TB and the Bacillus Calmette-Guérin (BCG) vaccination, and other risk factors.

See the NICE guideline on Tuberculosis (reference link at heading of this section) for further information on appropriate testing for different groups.

Mantoux test:

- Tuberculin is injected intradermally. The skin is inspected for signs of a local skin reaction (induration) after 2–3 days, and the test is considered positive at an induration of 5 mm or more, regardless of previous BCG vaccination history.
- The Mantoux test may be offered to children and young people aged 2–17 years who have been in close contact with people with pulmonary or laryngeal TB, and to new entrants to the UK from high TB prevalence countries.

Interferon gamma release assay (IGRA) test:

- This is a blood test based on detecting the response of white blood cells to TB antigens. It is less likely to give false positive results compared with a Mantoux test and gives a rapid result.
- Both a Mantoux test and IGRA may be offered to people who are severely immunocompromised at risk of TB.
- People younger than 65 years of age from under-served groups (such as the homeless or substance misusers) may be offered a single IGRA test.

Vaccination with live viruses may interfere with test reactions. For persons scheduled to receive a tuberculin sensitivity test, testing should be done as follows:[5]

- Either on the same day as vaccination with live-virus vaccine or 4-6 weeks after the administration of the live-virus vaccine.
- At least one month after smallpox vaccination.

Active case finding[5]

Detecting TB early allows early treatment initiation and prevents further spread. Active case finding usually focuses on detecting of pulmonary TB using CXRs or performing a symptom enquiry. Abnormal results can then be followed by further tests - eg, sputum. Active case finding has been widely used amongst risk groups in low-incidence countries.[6] In the UK, active case finding is performed amongst the following groups:

- Professionals at risk of TB (eg, healthcare workers).
- Close contacts of patients with TB (if active TB is suspected).
- Persons with social risk factors - eg:
    - Homeless persons.
    - Persons with drug and/or alcohol problems.
    - Prisoners.
    - Immigrants from countries where TB is common.

Contact tracing should be carried out by the multidisciplinary TB team. Detailed guidance has been outlined by NICE.[3]

- It aims to detect people infected with TB but with no clinical evidence of disease (10% of all TB diagnoses).
- It aims to identify BCG vaccination candidates.
- It aims to detect a source patient - eg, when a child is diagnosed with TB.

Screening is recommended for selected contacts, since the source case has exhibited respiratory symptoms. If this is unknown, contacts during the three months preceding the initial diagnosis are screened. Tracing should be extended backwards if necessary.

Management of contacts

If a test for latent TB infection is positive:[4]

- The person should be assessed for active TB, and if there is no evidence of active infection on the basis of symptoms and chest X-ray, the person should be treated for latent TB infection by the local multidisciplinary TB team to prevent progression to active disease.
- Drug regimens are usually either 3 months of isoniazid (with pyridoxine) and rifampicin, or 6 months of isoniazid (with pyridoxine).

See the separate article on Tuberculosis for further information, including the management of people with active TB.

Further reading

- Ding C, Ji Z, Zheng L, et al; Population-based active screening strategy contributes to the prevention and control of tuberculosis. Zhejiang Da Xue Xue Bao Yi Xue Ban. 2022 Dec 25;51(6):669-678. doi: 10.3724/zdxbyxb-2022-0426.
- Silva DR, Mello FCQ, Johansen FDC, et al; Migration and medical screening for tuberculosis. J Bras Pneumol. 2023 Apr 28;49(2):e20230051. doi: 10.36416/1806-3756/e20230051. eCollection 2023.

References

1. Tuberculosis (TB); World Health Organization
2. Immunisation against infectious disease - the Green Book (latest edition); UK Health Security Agency.
3. Tuberculosis; NICE Guideline (January 2016 - last updated September 2019)
4. Tuberculosis; NICE CKS, January 2019 (UK access only)
5. Tuberculosis (TB) and other mycobacterial diseases: diagnosis, screening, management and data; United Kingdom Health Security Agency
6. Zenner D, Southern J, van Hest R, et al; Active case finding for tuberculosis among high-risk groups in low-incidence countries. Int J Tuberc Lung Dis. 2013 May;17(5):573-82. doi: 10.5588/ijtld.12.0920.

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