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National Institute for Health and Clinical Excellence

Quick reference guide

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Tuberculosis

Clinical diagnosis and management of tuberculosis, and measures for its prevention and control

This updates and replaces NICE clinical guideline 33

NICE clinical guideline 117
Developed by the National Collaborating Centre for Chronic Conditions and the Centre for Clinical Practice at NICE

About this booklet

This is a quick reference guide that summarises the recommendations NICE has made to the NHS in 'Tuberculosis: clinical diagnosis and management of tuberculosis, and measures for its prevention and control' (NICE clinical guideline 117).

This guidance updates and replaces NICE clinical guideline 33 (published March 2006). New recommendations on using interferon-gamma tests for the diagnosis of latent tuberculosis (TB) have been added.

Who should read this booklet?

This quick reference guide is for doctors, nurses, and other staff who care for people with TB and staff involved in screening for TB.

Who wrote the guideline?

The original guideline was developed by the National Collaborating Centre for Chronic Conditions (now the National Clinical Guideline Centre), which is based at the Royal College of Physicians. The recommendations on the use of interferon-gamma tests for the diagnosis of latent TB were developed or updated by the Centre for Clinical Practice at NICE. The Collaborating Centre and the Centre for Clinical Practice worked with a group of healthcare professionals (including consultants, GPs and nurses), patients and carers, and technical staff, who reviewed the evidence and drafted the recommendations. The recommendations were finalised after public consultation.

For more information on how NICE clinical guidelines are developed, go to **www.nice.org.uk**

Where can I get more information about the guideline?

The NICE website has the recommendations in full, reviews of the evidence they are based on, a summary of the guideline for patients and carers, and tools to support implementation (see page 23 for more details).

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Introduction

The incidence of tuberculosis (TB) is influenced by risk factors such as exposure to, and susceptibility to, TB and by poverty, housing, nutrition and access to healthcare, and differs across England and Wales. This guideline looks at the diagnosis and treatment of TB and screening of people who are most at risk of TB.

Patient-centred care

Treatment and care should take into account patients' individual needs and preferences. Good communication is essential, supported by evidence-based information, to allow patients to reach informed decisions about their care. Follow advice on seeking consent from the Department of Health or Welsh Assembly Government if needed. If the patient agrees, families and carers should have the opportunity to be involved in decisions about treatment and care. If caring for young people in transition between paediatric and adult services refer to 'Transition: getting it right for young people' (available from **www.dh.gov.uk**).

Key to terms

CCDC Consultant in communicable disease control.

Close contacts These may include a boyfriend or girlfriend and frequent visitors to the home of the index case, in addition to household contacts.

DOT Directly observed therapy.

Dual strategy A Mantoux test followed by an interferon-gamma test if the Mantoux is positive.

Green Book The 2006 edition of 'Immunisation against infectious disease', published by the Department of Health. Updated chapters are available from **www.dh.gov.uk**

Hard-to-reach groups Children, young people and adults whose social circumstances or lifestyle, or those of their parents or carers, make it difficult to:

- recognise the clinical onset of TB
- access diagnostic and treatment services
- self-administer treatment (or, in the case of children, have treatment administered by a parent or carer)
- attend regular appointments for clinical follow-up.

High-incidence country Country with more than 40 cases per 100,000 per year; these are listed by the Health Protection Agency – go to **www.hpa.org.uk** and search for 'WHO country data TB'.

High-incidence primary care organisation Primary care organisation with more than 40 cases per 100,000 per year; these are listed by the Health Protection Agency – go to **www.hpa.org.uk** and search for 'TB average case reports'.

Household contacts People sharing a bedroom, kitchen, bathroom or sitting room with the index case.

'Inform and advise' information Advice on the risks and symptoms of TB, usually given in a standard letter.

Mantoux negative Induration less than 6 mm.

Mantoux positive Induration 6 mm or greater.

Mantoux strongly positive Induration 15 mm or greater.

Negative-pressure rooms Rooms where air pressure is continuously measured so that air cannot escape from the room into other parts of the hospital.

New entrants People who have recently arrived in or returned to the UK from high-incidence countries.

Respiratory TB TB affecting the lungs, pleural cavity, mediastinal lymph nodes or larynx.

Sputum-smear-positive TB TB where mycobacteria can be seen in sputum samples under the microscope.

Standard recommended regimen The '6-month, four-drug initial regimen' of 6 months of isoniazid and rifampicin supplemented in the first 2 months with pyrazinamide and ethambutol.

Key priorities for implementation

Management of active TB

- 6-month, four-drug initial regimen (6 months of isoniazid and rifampicin supplemented in the first 2 months with pyrazinamide and ethambutol) should be used to treat active respiratory TB in:
  - adults not known to be HIV positive
  - adults who are HIV positive
  - children.

This regimen is referred to as 'standard recommended regimen' in this guideline.

- Patients with active meningeal TB should be offered:
  - a treatment regimen, initially lasting for 12 months, comprising isoniazid, pyrazinamide, rifampicin and a fourth drug (for example, ethambutol) for the first 2 months, followed by isoniazid and rifampicin for the rest of the treatment period
  - a glucocorticoid at the normal dose range
    - adults – equivalent to prednisolone 20–40 mg if on rifampicin, otherwise 10–20 mg
    - children – equivalent to prednisolone 1–2 mg/kg, maximum 40 mg

    with gradual withdrawal of the glucocorticoid considered, starting within 2–3 weeks of initiation.

Improving adherence

- Use of directly observed therapy (DOT) is not usually necessary in the management of most cases of active TB. All patients should have a risk assessment for adherence to treatment, and DOT should be considered for patients who have adverse factors on their risk assessment, in particular:
  - street- or shelter-dwelling homeless people with active TB
  - patients with likely poor adherence, in particular those who have a history of non-adherence.
- The TB service should tell each person with TB who their named key worker is, and how to contact them. This key worker should facilitate education and involvement of the person with TB in achieving adherence.

New entrant screening

- New entrants should be identified for TB screening from the following information:
  - Port of Arrival reports
  - new registrations with primary care
  - entry to education (including universities)
  - links with statutory and voluntary groups working with new entrants.

BCG vaccination

- Neonatal BCG vaccination for any baby at increased risk of TB should be discussed with the parents or legal guardian.
- Primary care organisations with a high incidence of TB should consider vaccinating all neonates soon after birth.

Diagnosing active TB

Respiratory TB

- Take a posterior–anterior chest X-ray – if this suggests TB, arrange further tests.
- Send at least three sputum samples (including one early morning sample) for culture and microscopy.
- Samples should be spontaneously produced if possible. If not possible:
  - in adults, use induction of sputum or bronchoscopy and lavage
  - in children, consider induction of sputum if it can be done safely, or gastric washings if not.
- Take samples before starting treatment if possible, or within 7 days of starting treatment.
- Start treatment without waiting for culture results if the patient has clinical signs and symptoms of TB.
- Continue the standard recommended regimen in patients whose subsequent culture results are negative.
- Send autopsy samples for culture if respiratory TB was a possibility.

Active non-respiratory TB

- Discuss the advantages and disadvantages of biopsy and needle aspiration with the patient.
- If non-respiratory TB is a possibility, place all or part of any of the following samples in a dry pot and send for TB culture:
  - lymph node biopsy or pus aspirated from lymph nodes
  - pleural biopsy
  - any surgical or radiological sample sent for routine culture
  - histology, aspiration and autopsy samples.

  Microbiology staff should routinely perform TB culture on these samples (even if it is not requested).
- If the histology and clinical picture are consistent with TB, start the appropriate treatment regimen without waiting for culture results.
- Continue drug treatment even if culture results are negative.
- Do a chest X-ray to check for coexisting respiratory TB in all patients with non-respiratory TB, and consider other investigations (for details, see table 1).

Laboratory tests

- Send clinical samples for culture by automated liquid methods.
- Use rapid diagnostic tests for *Mycobacterium tuberculosis* complex (*M tuberculosis*, *M bovis* and *M africanum*) on primary specimens only if:
  - rapid confirmation of TB in a sputum smear-positive patient would alter their care, **or**
  - before conducting a large contact-tracing initiative.
- Use rapid diagnostic tests for *M tuberculosis* complex identification on biopsy material only if:
  - all the sample has been inappropriately placed in formalin, **and**
  - acid-fast bacilli are visible on microscopy.

Table 1 Suggested site-specific investigations in the diagnosis and assessment of non-respiratory TB

Site	Imaging	Biopsy	Culture
Lymph node		• Node	• Node or aspirate
Bone/joint	• Plain X-ray and computed tomography (CT) • Magnetic resonance imaging (MRI)	• Site of disease	• Biopsy or paraspinal abscess • Site or joint fluid
Gastrointestinal	• Ultrasound • CT abdomen	• Omentum • Bowel	• Biopsy • Ascites
Genitourinary	• Intravenous urography • Ultrasound	• Site of disease	• Early morning urine • Site of disease • Endometrial curettings
Disseminated	• High-resolution CT thorax • Ultrasound abdomen	• Lung • Liver • Bone marrow	• Bronchial wash • Liver • Bone marrow • Blood
Central nervous system	• CT brain • MRI	• Tuberculoma	• Cerebrospinal fluid
Skin		• Site of disease	• Site of disease
Pericardium	• Echocardiogram	• Pericardium	• Pericardial fluid
Cold/liver abscess	• Ultrasound	• Site of disease	• Site of disease

- Confirm the species of *Mycobacterium* to be *M tuberculosis* complex by rapid diagnostic tests on microscopy- or culture-positive material before conducting a large contact-tracing initiative. Use clinical judgement if tests are inconclusive or delayed.
- If rapid diagnostic tests are negative:
  - still consider a diagnosis of non-respiratory TB
  - start treatment if clinical signs and other laboratory findings are consistent with TB meningitis.
- If a risk assessment suggests a patient has multidrug-resistant (MDR) TB:
  - do rapid diagnostic tests for rifampicin resistance
  - start infection control measures and treatment for MDR TB while waiting for the results.

Treatment of active TB

Patients diagnosed with active TB should be referred to a physician with training and experience in treating patients with TB.

Drug treatment

- The standard recommended regimen is 6 months of isoniazid and rifampicin initially, plus pyrazinamide and ethambutol for the first 2 months.
- Use fixed-dose combination tablets as first choice.
- Do not use a twice-weekly regimen.
- Use daily dosing for all types of non-respiratory TB as first choice. See table 2 for more details.
- Use the standard recommended regimen to treat fully drug-susceptible TB at all sites except the central nervous system (CNS) in patients of all ages, including those who are HIV positive.
- Consider a three-times-weekly regimen for patients receiving DOT.

Table 2 Special considerations for active non-respiratory TB

Site	Treatment
Meninges	• Isoniazid, rifampicin, pyrazinamide and a fourth drug (such as ethambutol) for 2 months, then isoniazid and rifampicin for the rest of the treatment – initially 12 months • Add a glucocorticoid equivalent to prednisolone 20–40 mg if on rifampicin, otherwise 10–20 mg (adults); or 1–2 mg/kg, maximum 40 mg (children); consider gradual withdrawal starting within 2–3 weeks
Peripheral lymph nodes	• First choice is the standard recommended regimen • Use this regimen even if an affected lymph gland has been removed surgically • Normally, stop treatment after 6 months, regardless of the appearance of new nodes, residual nodes or sinuses draining
Bones and joints	• First choice is the standard recommended regimen • Do a CT or MRI scan on patients with active spinal TB who have neurological signs or symptoms; treat as for meningeal TB if the spinal cord is directly involved • For spinal TB, consider anterior spinal fusion if there is spinal instability or evidence of compression
Pericardium	• First choice is the standard recommended regimen • Add a glucocorticoid equivalent to prednisolone at 60 mg/day (adults) or 1 mg/kg/day (maximum 40 mg/day; children); consider gradual withdrawal, starting within 2–3 weeks
Disseminated, including miliary	• First choice is the standard recommended regimen • Start treatment even if initial liver function tests are abnormal; seek advice from a specialist if liver function deteriorates significantly on treatment • Check for CNS involvement by CT or MRI scan and/or lumbar puncture if there are CNS signs or symptoms, or a lumbar puncture if not • Treat as for meningeal TB if the CNS is involved

Improving adherence to treatment

To promote adherence, involve patients in treatment decisions at the outset, and emphasise the importance of adherence. Do a risk assessment for adherence to treatment for all patients.

- Everyone with TB should know who their named key worker is, and how to contact them. The key worker should educate the person about TB, and involve them in achieving adherence.
- Liquid preparations of anti-TB drugs should be available.
- TB services should provide written patient information in languages used locally, and in other formats (such as audiovisual) as needed. See **www.hpa.org.uk** for examples.

Possible interventions if a patient defaults from treatment

- Reminder letters in appropriate languages.
- Health education counselling.
- Patient-centred interview and health education booklet.
- Home visits.
- Patient diary.
- Random urine tests and other monitoring (for example, pill counts).
- Information about help with paying for prescriptions.
- Help or advice about where and how to get social security benefits, housing and social services.

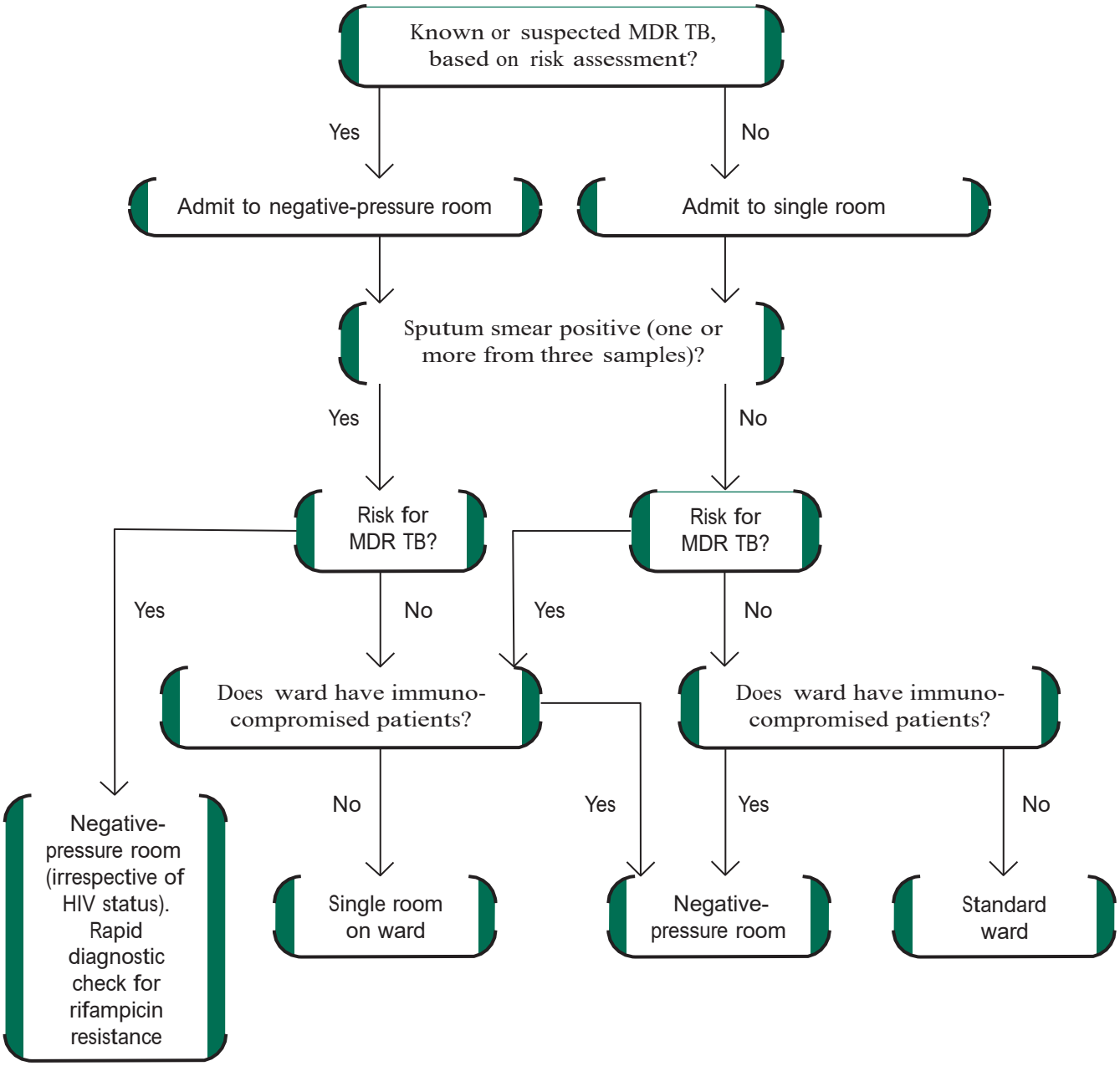
Directly observed therapy

- DOT is not usually needed for most cases of active TB.
- Consider DOT for patients who have adverse factors on their risk assessment, in particular:
  - street- or shelter-dwelling homeless people with active TB
  - patients with likely poor adherence, especially those who have a history of non-adherence.
- When planning a course of DOT:
  - Consider ways to mitigate the environmental, financial and psychosocial factors that may reduce adherence, including stability of accommodation, prescription charges and transport.
  - Arrange the setting, observer and frequency of treatment to be most practicable for the person with TB.
  - Involve the person with TB and their assigned key worker in deciding these arrangements.
  - Arrange frequent contact with the key worker.

Treatment completion and follow-up

- Do not offer follow-up clinic visits routinely after treatment completion.
- Tell patients to watch for symptoms of relapse and how to contact the TB service rapidly – especially if they are at increased risk of relapse.
- Consider 12 months' follow-up after completion of treatment for drug-resistant TB, and prolonged follow-up for MDR TB.

Figure 1 Infection control



Admit people with TB at any site to hospital for diagnostic tests or care only if there is a clear clinical or socioeconomic need, such as homelessness.

- Screen visitors to a child with TB in hospital as part of contact tracing, and keep them separate from other patients until they have been excluded as the source of infection.
- Perform aerosol-generating procedures such as bronchoscopy, sputum induction or nebuliser treatment in an appropriately engineered and ventilated area for:
  - all patients on an HIV ward, and
  - all patients in whom TB is possible, in any setting.
- Do not use masks, gowns or barrier nursing techniques unless:
  - you suspect a person has MDR TB, or
  - you are performing aerosol-generating procedures.

  Tell the patient why they are needed.
- Ask inpatients with smear-positive TB to wear a surgical mask whenever they leave their room until they have had 2 weeks' drug treatment, and explain why.

Leaving isolation

- Smear-positive TB patients without risk factors for MDR TB (see page 12) may leave the single room after 2 weeks' treatment, or on discharge.
- Patients who will share a ward or home with people who are immunocompromised, including those who are HIV positive, should stay in a negative-pressure room until:

  For people who were sputum smear positive at admission:

  1. they have had at least 2 weeks of appropriate multiple drug therapy, **and**
  2. they have had at least three negative microscopic smears on separate occasions over a 14-day period, **and**
  3. they are showing tolerance to the prescribed treatment and an ability and agreement to adhere to treatment, **and either**
  4. any cough has resolved completely, **or**
  5. there is definite clinical improvement on treatment, for example remaining afebrile for a week.

  For people who were sputum smear negative at admission: all of 1, 2, 3 and 5.

Risk assessment and infection control for drug-resistant TB

Risk factors

- Assess risk of drug resistance for each patient with TB, based on these risk factors:
  - a history of prior TB drug treatment; prior TB treatment failure
  - contact with a known case of drug-resistant TB
  - birth in a foreign country, particularly a high-incidence country
  - HIV infection
  - residence in London
  - age profile (rates are highest between ages 25 and 44 years)
  - male gender.
- If the TB service regards the risk as significant, arrange urgent rapid diagnostic tests for rifampicin resistance.
- Monitor response to treatment closely in patients at risk of drug resistance. If there is no clinical improvement, or if cultures remain positive after the fourth month of treatment, review treatment with a specialist.
- Discuss options for organising care for people with MDR TB with specialists. Take the patient's views into account and consider shared care.

Preventing transmission and treating latent TB

Contact tracing

- Once a patient has been diagnosed with active TB, inform colleagues so that need for contact tracing can be assessed. Do not delay contact tracing until notification.
- Offer 'Inform and advise' information to all contacts of sputum-smear-positive TB or of cattle with TB.

Table 3 Assessment and screening of contacts of active TB

Type of contact with active TB	Assessment and screening
Household contacts of person with active TB at any site	• Offer screening: – if aged 35 years or younger, test for latent TB; consider BCG or treatment for latent TB infection once active TB has been ruled out – if older than 35 years, do a chest X-ray (if there are no contraindications), and further investigation for active TB if needed • See figures 2 and 3
Other close contacts of person with sputum-smear-positive TB	• Offer screening as for household contacts • Assess workplace contacts only if contact is judged equivalent to household contacts
Casual contacts of person with TB at any site (includes most workplace contacts)	• Do not routinely offer contact tracing • Consider contract tracing only if the index case is particularly infectious (evidence of transmission to close contacts) or if casual contacts are at special risk of infection
Contacts of cattle with TB	• Offer screening only for children younger than 16 years without BCG who have regularly drunk unpasteurised milk from animals with TB udder lesions
Contacts of aircraft passenger later diagnosed with TB	• Do not routinely offer screening • Inform relevant CCDC if: – the flight was in the past 3 months **and** – the flight lasted for more than 8 hours **and** – the index case is sputum smear positive **and either** ♦ the index case coughed frequently during the flight **or** ♦ the index case has MDR TB • The CCDC should send 'Inform and advise' information to the airline, to send to passengers who sat in the same part of the aircraft as the person with TB if screening is needed (usually three rows on either side of the patient)
Contacts of aircraft crew with TB	• Contact tracing not usually needed for passengers • Assess other members of staff as normal for workplace contacts

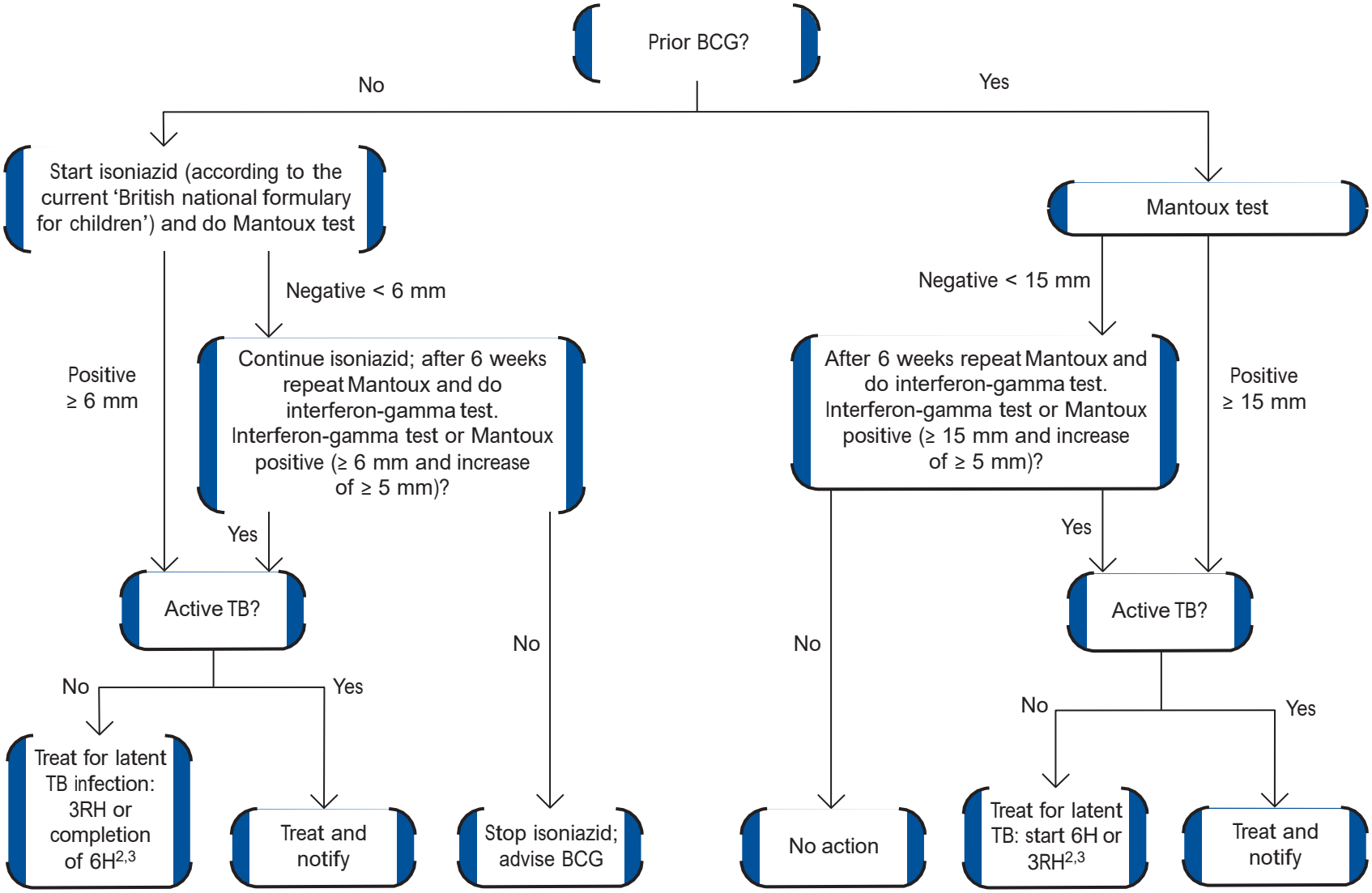
Continued

Table 3 Assessment and screening of contacts of active TB (continued)

Type of contact with active TB	Assessment and screening
Contacts of school pupil or teacher with TB	• Assess: – pupils sharing any classes with a pupil with sputum-smear-positive TB – pupils in the classes of a teacher with sputum-smear-positive TB in the previous 3 months • Consider tracing children and staff involved in extracurricular activities and non-teaching staff depending on: – degree of infectivity of the index case – duration and proximity of contact – whether contacts are unusually susceptible to infection • The CCDC should be prepared to explain prevention and control procedures to staff, parents and the press • Treat secondary cases of sputum-smear-positive TB as index cases for contact tracing • If the index case of a pupil's infection is not found, and the child is not in a high-risk group, consider contact tracing and symptom enquiry or chest X-ray for all relevant school staff
Contacts of sputum-smear-positive TB in adult worker in childcare (including informal childcare)	• Assess need for contact tracing as for casual and close contacts of any person with sputum-smear-positive TB
Contacts of hospital inpatient with TB	• Do a risk assessment covering: – degree of infectivity of the index case – duration and proximity of contact – susceptibility of other patients • Do contact tracing and testing only in patients at significant risk • Manage patients as household contacts if they were exposed to a patient with sputum-smear-positive TB for long enough to be equivalent, or are particularly susceptible to infection • If the inpatient has MDR TB, or exposed patients are HIV positive, do contact tracing in line with the Interdepartmental Working Group on Tuberculosis guidelines[1] • If in doubt seek advice from the Health Protection Agency or specialists • Patients are at risk if they spent more than 8 hours in the same bay as a patient with sputum-smear-positive TB and a cough. Document this in their notes, for the attention of their consultant. Give 'Inform and advise' information, and tell their GP

[1] 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. Available from www.dh.gov.uk

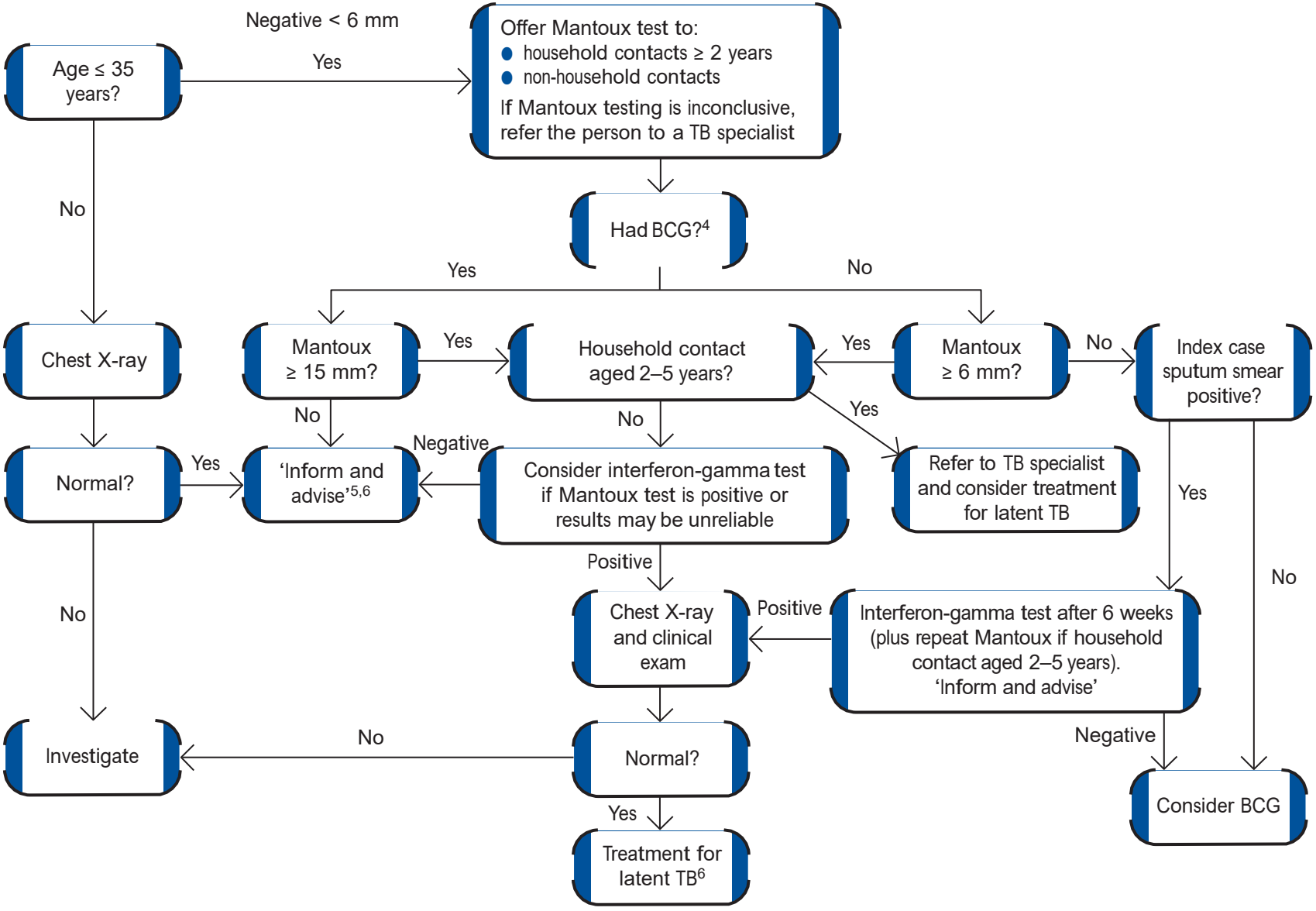
Figure 2 Testing and treating asymptomatic children aged 4 weeks–2 years who are close contacts of people with sputum-smear-positive TB



[2] Drug regimens are often abbreviated to the number of months a phase of treatment lasts, followed by letters for the drugs offered in that phase: H is isoniazid, R rifampicin, E ethambutol, S streptomycin. So 3RH is 3 months of rifampicin and isoniazid, 6H is 6 months of isoniazid.

[3] If the child is known to be HIV positive, treatment for latent TB should be 6H.

Figure 3 Testing and treating asymptomatic household and other close contacts of all cases of active TB



[4] Previous BCG vaccination cannot be accepted as evidence of immunity in people with HIV.
[5] A negative test in immunocompromised people does not exclude TB infection.
[6] People offered treatment for latent TB infection, but who decline, should have 'Inform and advise' information reinforced and chest X-ray follow-up at 3 and 12 months.

High-risk populations and occupational health

New entrants

- Health screening programmes for new entrants should:
  - detect active and latent TB and start treatment
  - give BCG vaccination to people in high-risk groups who have not been vaccinated before and are not infected
  - give information to all new entrants.
- Identify new entrants for TB screening from Port of Arrival reports, new registrations with primary care, entry to education (including universities), and links with statutory and voluntary groups working with new entrants.
- Encourage new entrants to register with a GP.

Assessment and management of TB for new entrants

See table 4 for screening new entrants for latent TB.

- Risk assessment for HIV – take into account for Mantoux testing and BCG vaccination.
- Assessment for active TB if interferon-gamma test is positive, which would include a chest X-ray.
- Treatment for latent TB infection in people aged 35 years or younger after excluding active TB, if person has positive Mantoux test inconsistent with their BCG history, and positive interferon-gamma test.
- Consideration of BCG if unvaccinated and Mantoux negative (see page 22).
- 'Inform and advise' information for people who do not have active TB and are not being offered BCG or treatment for latent TB infection.

Street homeless

- Screen people who are street homeless (including those using direct access hostels) for active TB by chest X-rays, opportunistically and/or when they present with symptoms. Consider simple incentives for attending, such as hot drinks and snacks.
- Reinforce and update education about TB, and referral pathways, to primary care colleagues, social workers and voluntary workers who work with people who are homeless.

New NHS employees

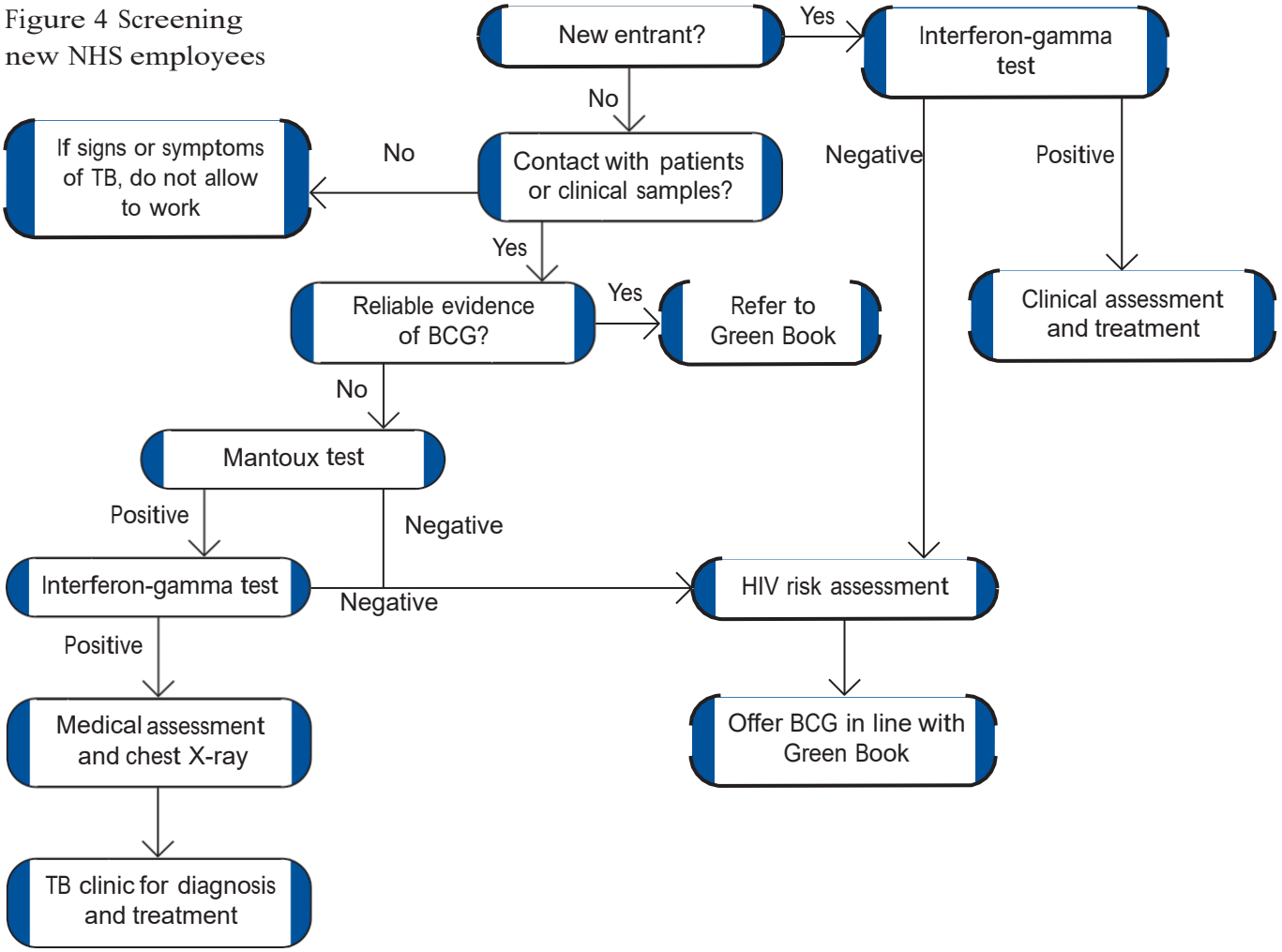
See figure 4.

- Employees new to the NHS who will be working with patients or clinical specimens should not start work until they have completed a TB screen or health check, or documentary evidence is provided of such screening in the last 12 months.
- New NHS employees who will not have patient contact should not start work if they have signs or symptoms of TB.
- Health checks for employees new to the NHS should include:
  - assessment of personal or family history of TB
  - symptoms and signs enquiry, possibly by questionnaire
  - documentary evidence of TB testing and/or BCG scar check by occupational health professional. Documentary evidence of screening to this standard should be sought from locum agencies and contractors who carry out their own screening
  - Mantoux result within the last 5 years, if available.
- A Mantoux-negative healthcare worker who declines BCG vaccination after explanation of the risks should not work where there is a risk of exposure to TB.
- NHS trusts should ensure that all workers and students who have contact with patients or clinical materials are screened for TB to the same standard as employees new to the NHS. This includes:
  - clinical students, agency/locum staff and contract ancillary workers
  - healthcare workers in non-NHS settings caring for NHS patients.

Healthcare: occupational health

- Include reminders of TB symptoms and the need for prompt reporting with annual reminders about occupational health for staff who:
  - are in regular contact with TB patients or clinical materials, **or**
  - have worked in a high-risk clinical setting for 4 weeks or longer.
- Send one-off reminders after a TB incident on a ward.
- If there is no documentary evidence of prior screening, screen staff in contact with patients or clinical material who are changing jobs as if they were new employees.
- For healthcare workers who are HIV positive:
  - assess TB risks at the time of recruitment
  - be aware of settings with increased risk of exposure to TB.
- If HIV is diagnosed during employment, assess TB risk and modify the person's work if needed.

Figure 4 Screening new NHS employees



Prisons and remand centres

- Be aware of the signs and symptoms of active TB, and promote awareness among prisoners and prison staff.
- Screen prisoners for TB by:
  - a health questionnaire on each entry to the prison system **then**
  - if there are signs and symptoms of active TB, a chest X-ray and microscopy on three sputum samples taken in 24 hours, including a morning sample.
- Provide DOT for all prisoners receiving treatment for active or latent TB.
- Before a prisoner is transferred between prisons, make arrangements to ensure continuity of care.
- Have plans in place for continuing treatment after an early discharge, and give the prisoner contact details for a named key worker, who will visit them after release and liaise between services.
- Provide pre- and on-employment screening at the same level as for healthcare workers for prison staff and others who have regular contact with prisoners (for example, probation officers and education and social workers).

Screening tests

Table 4 Screening tests for latent TB

Population	Screening protocol
Neonatal close contacts of people with sputum-smear-positive TB (who have not had 2 weeks of treatment)	• Start on isoniazid (according to the current 'British national formulary for children') for 3 months then do a Mantoux test: – If positive, assess to exclude active TB. If no active TB, continue isoniazid for a total of 6 months – If negative, repeat Mantoux test at same time as interferon-gamma test. If both negative stop isoniazid and give BCG
Close contacts aged 4 weeks to 2 years of people with sputum-smear-positive TB	• See figure 2
Household contacts aged 2–5 years	• See figure 3
All contacts aged 5 years and older	• See figure 3 • In an outbreak situation when a large number of people might need to be screened offer a single interferon-gamma test
New entrants from high-incidence countries aged under 5 years	• Mantoux test – if positive take into account BCG history, refer to TB specialist to exclude active disease and consider treating for latent TB
New entrants from high-incidence countries aged 5–15 years	• Mantoux test • Interferon-gamma test if Mantoux positive
New entrants from high-incidence countries aged 16 years and older	• Interferon-gamma test or dual strategy • If older than 35 years consider individual risks and benefits of treatment before offering testing
Immunocompromised people (not with HIV)	• Interferon-gamma test or interferon-gamma test plus concurrent Mantoux test • If either test is positive do a clinical assessment to exclude active TB and consider treating latent TB • If a child and latent TB is suspected, refer to TB specialist
People with HIV and CD4 count < 200	• Interferon-gamma test plus concurrent Mantoux test • If either test is positive do a clinical assessment to exclude active TB and consider treating latent TB
People with HIV and CD4 count 200–500	• Interferon-gamma test or interferon-gamma test plus concurrent Mantoux test • If either test is positive perform a clinical assessment to exclude active TB and consider treating latent TB
New healthcare workers who are new entrants from high-incidence countries, or who have had contact with patients in high-prevalence setting	• See figure 4
Other new healthcare workers without BCG in contact with patients or clinical materials	• See figure 4
Hard-to-reach groups	• Interferon-gamma test

Treatment of latent TB

Treatment of latent TB should be considered for some people with **positive screening results** after active TB has been excluded.

Table 5 Treatment regimens for latent TB

Population	Treatment regimen
Neonates who are close contacts of people with sputum-smear-positive TB	• Treatment for latent TB is started at time of screening tests • See table 4
Children aged 4 weeks to 2 years who are close contacts of people with sputum-smear-positive TB and have not had BCG	• See figure 2
Children aged 4 weeks to 2 years who are close contacts of people with sputum-smear-positive TB and have had BCG	• See figure 2
People aged 35 years or younger[7], who are Mantoux positive (without prior BCG) or Mantoux strongly positive (with prior BCG)	• Rifampicin and isoniazid for 3 months or isoniazid for 6 months • Treatment decisions should be based on an individual assessment of the balance of risks and benefits
Children aged 1–15 years identified through opportunistic screening to be strongly Mantoux positive, interferon-gamma positive, and without prior BCG.	
Healthcare workers	
People with TB scars on X-ray and no history of adequate treatment	
People of any age who have HIV	• Isoniazid for 6 months
People who are contacts of people with isoniazid-resistant TB	• Rifampicin for 6 months
People who are close contacts of people with sputum-smear-positive MDR TB and who are strongly Mantoux positive (≥ 15 mm)	• Do not start treatment • No regimen has proven benefit and only a small proportion of affected people will develop active TB • Undertake long-term monitoring for active disease

[7]For people aged 36 years or older, consider risks and benefits for the individual before offering treatment.

- Be aware that people with latent TB in these groups are at increased risk of developing active TB:
  - HIV positive
  - injecting drug users
  - have had solid organ transplantation, jejunoileal bypass or gastrectomy
  - have a haematological malignancy
  - have chronic renal failure or receive haemodialysis
  - are receiving anti-tumour necrosis factor-alpha treatment
  - have silicosis.

BCG vaccination

Always discuss the benefits and risks when offering BCG. Give information tailored to the person, in an appropriate language, and taking into account cultural sensitivities and stigma.

If the person was identified through occupational health, contact tracing or new entrant screening and could be at risk of having HIV, offer HIV testing before BCG vaccination.

Table 6: BCG vaccination criteria

Group	Criteria for offering vaccination
Neonates	• Born in an area with notification rate > 40 per 100,000 **or** • One or more parents or grandparents born in a high-incidence country **or** • Family history of TB in previous 5 years • Primary care organisations with a high incidence of TB should consider vaccinating all neonates
Infants and older children (older than 4 weeks and younger than 16 years)	• Assessed as at increased risk, and would have qualified for neonatal vaccination **and** Mantoux negative • Routine vaccination for children aged 10–14 years is not recommended • Follow Chief Medical Officer's advice[8] • Do not do routine Mantoux test before BCG in children younger than 6 years unless they were born in or visited (> 1 month) a high-incidence country
New entrants	• Mantoux negative • From high-incidence country **and** • No evidence of vaccination from documentation or scar **and** • Are aged younger than 16 years, or 16 to 35 years from sub-Saharan Africa or a country with a TB incidence of 500 per 100,000[9]
Healthcare workers in contact with patients or clinical specimens	• No evidence of vaccination from documentation or scar **and** • Will have contact with patients or clinical materials **and** • Mantoux or interferon-gamma negative • Offer to workers of any age who meet the criteria
Contacts of people with respiratory TB	• No evidence of vaccination from documentation or scar **and** • Aged 35 years or younger **and** • Mantoux negative • Offer to healthcare workers of any age who are in contact with patients or clinical material
Other people at increased risk of TB	• Aged 35 years or younger **and** • Mantoux negative **and** • Work with animals susceptible to TB **or** • Work with prisoners **or** • Work in a care home for elderly people **or** • Work in a hostel for homeless people, refugees or asylum seekers **or** • Intend to live or work with local people in a high-incidence country for more than 1 month • See the Green Book for details

[8] Available from www.dh.gov.uk

[9] The Green Book recommends BCG for recent arrivals only up to the age of 16 years. However, in this guideline BCG is recommended for those aged up to 35 years who come from the countries with the very highest rates of TB because there is some evidence of cost effectiveness.

Further information

Ordering information

You can download the following documents from **www.nice.org.uk/guidance/CG117**

- The NICE guideline – all the recommendations.
- A quick reference guide (this document) – a summary of the recommendations for healthcare professionals.
- 'Understanding NICE guidance' – a summary for patients and carers.
- The full guideline – all the recommendations, details of how they were developed, and reviews of the evidence they were based on.

For printed copies of the quick reference guide or 'Understanding NICE guidance', phone NICE publications on 0845 003 7783 or email publications@nice.org.uk and quote:

- N2458 (quick reference guide)
- N2459 ('Understanding NICE guidance').

Implementation tools

NICE has developed tools to help organisations implement this guidance (see **www.nice.org.uk/guidance/CG117**).

Related NICE guidance

For information about NICE guidance that has been issued or is in development, see **www.nice.org.uk**

Published

- Medicines adherence. NICE clinical guideline 76 (2009). Available from **www.nice.org.uk/guidance/CG76**

Under development

- Identifying and managing tuberculosis among hard-to-reach groups. NICE public health guidance (publication expected March 2012).

Updating the guideline

This guideline will be updated as needed, and information about the progress of any update will be available at **www.nice.org.uk/guidance/CG117**

NICE clinical guidelines are recommendations about the treatment and care of people with specific diseases and conditions in the NHS in England and Wales.

This guidance represents the view of NICE, which was arrived at after careful consideration of the evidence available. Healthcare professionals are expected to take it fully into account when exercising their clinical judgement. However, the guidance does not override the individual responsibility of healthcare professionals to make decisions appropriate to the circumstances of the individual patient, in consultation with the patient and/or guardian or carer, and informed by the summary of product characteristics of any drugs they are considering.

Implementation of this guidance is the responsibility of local commissioners and/or providers. Commissioners and providers are reminded that it is their responsibility to implement the guidance, in their local context, in light of their duties to avoid unlawful discrimination and to have regard to promoting equality of opportunity. Nothing in this guidance should be interpreted in a way that would be inconsistent with compliance with those duties.

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