

Guidance for National Tuberculosis Programmes on the
management of tuberculosis in children
CHAPTER 5 IN THE SERIES

Chapter 5: Health staff roles and responsibilities, recording and reporting and BCG vaccination

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SUMMARY

A range of different care providers with varying levels of expertise and experience, including primary care staff, general clinicians, and paediatricians, may be involved in managing children with tuberculosis (TB). Clarifying the roles and responsibilities of health care staff for the diagnosis, treatment and prevention of TB in children is important. Roles and responsibilities depend on the relevant level of the health care system (primary, first referral and second referral). All providers of TB care should manage TB patients in conjunction with the National Tuberculosis Programme (NTP). A key aspect of the overall approach to managing children with TB is that they should always be included in the routine NTP recording and reporting system. This means notifying all identified TB cases in

children to the NTP, registering them for treatment and recording their treatment outcome. The WHO Expanded Programme on Immunization (EPI) recommends BCG vaccination as soon as possible after birth in countries with a high TB prevalence. Although there have been several reports of disseminated BCG infection in HIV-infected individuals, BCG appears to be safe in the vast majority of cases. Therefore, in countries with a high TB prevalence (irrespective of the HIV prevalence), the benefits of BCG vaccination outweigh the risks and the WHO recommends a policy of routine BCG immunisation for all neonates.

KEY WORDS: TB; children; responsibilities; recording and reporting; BCG

HEALTH STAFF ROLES AND RESPONSIBILITIES

Children who are suspected of having or are diagnosed with tuberculosis (TB) may be managed by one or more of a range of different care providers with varying levels of expertise and experience, including primary care staff, general clinicians and paediatricians. In order to provide the best care for these children, it is essential to clarify the roles and responsibilities of those involved in their management. All providers of TB care should manage TB patients in conjunction with the National Tuberculosis Pro-

gramme (NTP). Although most adults with TB can be diagnosed with sputum smear microscopy and managed at the primary care level, the situation is different for children, for whom chest X-ray (CXR), tuberculin skin test (TST) and other tests are recommended wherever possible.

Levels of care

As the diagnosis of TB in children requires that a minimum of tests be available, service delivery with structured case management is recommended. For the different levels of care, Table 1 shows the staff likely to be available, their required competencies and the appropriate actions for managing children with tuberculosis. The patterns and delivery of services and the responsibilities of staff will differ between countries.

RECORDING AND REPORTING

Children with TB should always be included in the routine NTP recording and reporting system. NTPs should record and report two age groups for children,

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Table 1 Service delivery at different levels of care

Primary care level	
Staff	Medical assistants, nursing sisters and general practitioners
Minimum requirements	Trained to recognise the symptoms and elicit the signs of childhood TB Recognise the importance of being in contact with smear-positive source cases
Responsibilities	Identify children with symptoms and physical signs suggestive of TB as well as contacts of newly diagnosed smear-positive source cases Arrange treatment for children with disease (directly observed treatment) or infection and ensure referrals and follow-up
Action	Refer to first referral level of care
First referral level*	
Staff	Generalists, clinical officers and paediatricians
Minimum requirements	Trained to perform TST, lumbar puncture and pleural taps and read CXRs Have available TST, CXR and HIV testing (in high HIV prevalence areas)
Responsibilities	Be able to take a history, perform a physical examination and interpret the following tests: —sputum smear microscopy —culture for <i>M. tuberculosis</i> —TST —CXR —HIV testing (in high prevalence areas) —lumbar puncture and pleural tap
Action	Responsible for the diagnosis of TB infection and disease Refer and register the child with the NTP Refer child back to primary level for treatment and follow-up Manage common side effects and more serious cases (e.g., miliary TB)
Second referral level†	
Staff	Person with known expertise to manage complicated TB
Minimum requirements	This will differ depending on national priorities
Responsibilities	Diagnose and manage complicated TB, including most cases of disseminated TB and TB meningitis and MDR-TB in children
Actions	Responsible for the diagnosis and management of complicated childhood TB Advise the NTP on the management of complicated TB cases Refer and register the children with the NTP

* For example, community health centres and district hospitals.

† Tertiary care, including regional or national hospitals.

TB = tuberculosis; TST = tuberculin skin test; CXR = chest X-ray; HIV = human immunodeficiency virus; NTP = National Tuberculosis Programme; MDR-TB = multidrug-resistant TB.

0–4 years and 5–14 years, using the quarterly reporting form. Routine reporting of these two age groups has considerable benefits. Enumerating children with TB is a key step in bringing their management into the mainstream of the Stop TB strategy as part of routine

Table 2 Definitions of standard treatment outcomes

Standard treatment outcome	Definition
Cured	Patient who is sputum smear-negative in the last month of treatment and on at least one previous occasion
Completed treatment	Patient who has completed treatment but who does not meet the criteria to be classified as a cure or a failure
Default	Patient whose treatment was interrupted for 2 consecutive months or more
Death	Patient who dies for any reason during the course of treatment.
Treatment failure	Patient who is sputum smear-positive at 5 months or later during treatment
Transfer out	Patient who has been transferred to another recording and reporting unit and for whom the treatment outcome is not known

NTP activities. This age breakdown is crucial for ordering drugs (as child-friendly formulations are particularly important in children aged 0–4 years) and for monitoring trends in these two distinct age groups (as children aged 0–4 years are the most vulnerable, and infection at these early ages indicates recent transmission). In addition, routine NTP data collection will provide valuable and sustainable information on market needs concerning child-friendly formulations of anti-tuberculosis drugs.

It is crucial to notify the NTP of all identified TB cases in children, register them for treatment and record their treatment outcome at the end of the treatment course. The District TB Officer should record the outcome in the district TB register according to the standard outcomes (see Table 2).¹

Four of the standard outcomes are applicable to children with smear-negative pulmonary or extra-pulmonary TB: treatment completion, default, death and transfer out.

The District Tuberculosis Officer compiles and sends the quarterly district reports of all cases registered and their treatment outcomes to the Regional TB Officer. The Regional TB Officer verifies that the district reports are correct, complete and consistent, and submits a regional report to the central NTP. The indicators shown in Table 3 are useful for monitoring trends in case-finding and treatment outcomes.

BCG VACCINATION IN CHILDREN

Bacille Calmette-Guérin (BCG) is a live attenuated vaccine derived from *Mycobacterium bovis*. The World Health Organization's (WHO's) Expanded Programme on Immunization (EPI) recommends BCG vaccination as soon as possible after birth in countries with a high TB prevalence.² High TB prevalence countries are those that do not meet the criteria for low TB prevalence (see Table 4).

Table 3 Examples of indicators in routine NTP recording and reporting

Indicator	Significance
Proportion of all TB cases in children	May indicate over- or under-reporting of TB cases in children
Proportions of children with pulmonary and extra-pulmonary TB	May indicate over- or under-diagnosis of pulmonary and extra-pulmonary TB
Proportion of children who are cured (smear-positive TB) or complete treatment (smear-negative TB and extra-pulmonary TB)	Quality of management of children with TB in the NTP
Proportion of children with miliary TB or TB meningitis	This proportion should be very low where BCG coverage is high

NTP = National Tuberculosis Programme; TB = tuberculosis; BCG = bacille Calmette-Guérin.

In all countries, children with known primary (e.g., congenital) immunodeficiencies should not receive BCG vaccination. Although BCG has been given to children since the 1920s, controversies remain about its effectiveness in preventing TB disease among adults. Efficacy ranges from 0 to 80% in published studies from several areas of the world. There are several reasons for this variability, including the different types of BCG used in different areas, differences in the strains of *M. tuberculosis* in different areas, different levels of exposure and immunity to environmental mycobacteria and differences in immunisation practices. However, it is generally accepted that after effective BCG vaccination there is protection against the more severe types of TB such as miliary TB and tuberculous meningitis, which are most common in young children.

The human immunodeficiency virus (HIV) pandemic has had implications for BCG vaccination. The response to BCG vaccination may be reduced in HIV-infected individuals, and conversion to a positive TST after BCG is less frequent in HIV-infected individuals. Although there have been several reports of disseminated BCG infection in HIV-infected individuals, BCG appears to be safe in the vast majority of cases. It is recommended that a BCG vaccination policy should depend on the prevalence of TB in a country. In countries with high TB prevalence, the benefits of BCG vaccination outweigh the risks. In these countries, the WHO recommends a policy of routine BCG

Table 4 Definition of low TB prevalence countries

- Average annual notification rate of smear-positive PTB for the past 3 years <5/100 000
- Average annual notification rate of TB meningitis in children under 5 years for the past 5 years <1 case/1 000 000 population, AND
- Average annual risk of tuberculosis infection 0.1% or less

TB = tuberculosis; PTB = pulmonary tuberculosis.

immunisation for all neonates. A child who has not had routine neonatal BCG immunisation and has symptoms of HIV disease or the acquired immune-deficiency syndrome (AIDS) should not be given BCG because of the risk of disseminated BCG disease. BCG should not be given to HIV-infected children in low TB prevalence countries.

There is no evidence that revaccination with BCG affords any additional protection, and revaccination is therefore not recommended.

A small number of children (1–2%) develop complications following BCG vaccination. These most commonly include local abscesses, secondary bacterial infections, suppurative adenitis and local keloid formation. Most reactions will resolve over a few months. However, children who develop disseminated BCG disease should be investigated for immunodeficiencies and treated for TB using a first-line regimen (except pyrazinamide, to which *M. bovis* is uniformly resistant). Some children with persistent localised reactions may benefit from surgical excision.

Management of adverse reactions in HIV-infected children or children with other immunodeficiency syndromes is more complicated, and is discussed in Chapter 3 of this series 'Management of TB in the HIV-infected child'.³

References

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- 3 World Health Organization Stop TB Partnership Childhood TB Subgroup. Guidance for national tuberculosis programmes on the management of tuberculosis in children. Chapter 3. Management of TB in the HIV-infected child. Int J Tuberc Lung Dis 2006; 10: 1331–1336.

Suggested reading

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R É S U M É

Toute une série de pourvoyeurs de soins divers bénéficiant de niveaux variés de connaissance et d'expérience et comprenant le personnel de soins primaires, les cliniciens généraux et les pédiatres peuvent être impliqués dans la prise en charge des enfants atteints de tuberculose (TB). Il est important de clarifier les rôles et les responsabilités des personnels des soins de santé dans le diagnostic, le traitement et la prévention de la TB chez les enfants. Les rôles et les responsabilités dépendent du niveau du système de soins de santé concerné (niveau primaire, niveau de première ou de seconde référence). Tous les pourvoyeurs de soins de TB devraient prendre en charge les patients TB en collaboration avec le programme national de la TB (PNT). Un aspect-clé de l'approche globale de la prise en charge des enfants atteints de TB est qu'ils devraient toujours être inclus dans le système de routine du PNT

pour la déclaration et l'enregistrement. Ceci signifie qu'il faut déclarer tous les cas identifiés de TB chez l'enfant au PNT, les enregistrer pour traitement et signaler le résultat de leur traitement. Le Programme Étendu de Vaccination (EPI) de l'OMS recommande une vaccination par le BCG aussitôt que possible après la naissance dans les pays où la prévalence de TB est élevée. Bien qu'il y ait eu quelques cas d'infection disséminée au BCG chez les sujets infectés par le virus de l'immunodéficience humaine (VIH), dans la grande majorité des cas, la BCG s'avère sans danger. Pour cette raison, dans les pays où la prévalence de TB est élevée (quelle que soit la prévalence du VIH), les avantages de la vaccination par le BCG l'emportent sur les risques et l'OMS recommande une politique d'immunisation de routine par le BCG chez tous les nouveau-nés.

R E S U M E N

En el manejo de los niños con tuberculosis (TB) puede estar implicada una variedad de proveedores de atención de salud con diversos grados de pericia y experiencia, entre ellos personal de atención primaria, médicos generales y pediatras. Es primordial definir las funciones y las responsabilidades de los profesionales de la salud en el diagnóstico, el tratamiento y la prevención de la TB en la infancia. Las funciones y las responsabilidades dependen del nivel propio en el sistema de atención en salud (primario, primera referencia, segunda referencia). Todos los proveedores de atención en TB deben manejar los pacientes en colaboración con el Programa Nacional de Tuberculosis (PNT). Un aspecto primordial del enfoque global del manejo de niños con TB es que siempre deben incluirse en el sistema ordinario de registro y declaración del PNT. Esto significa declarar al PNT todos los casos

de TB diagnosticados en niños, registrarlos para tratamiento y registrar su desenlace terapéutico. En el Programa Ampliado de Inmunización (EPI) de la Organización Mundial de la Salud se recomienda la vacunación con el BCG tan pronto como sea posible después del nacimiento en los países con alta prevalencia de TB. Aunque se han informado algunos casos de infección diseminada por el BCG en individuos infectados por el virus de la inmunodeficiencia humana (VIH), la vacuna BCG parece segura en la gran mayoría de los casos. Por lo tanto, en países con alta prevalencia de TB (independientemente de la prevalencia de infección por el VIH) los beneficios de la vacuna BCG son mayores que los riesgos y la OMS recomienda una política de vacunación sistemática para todos los recién nacidos.