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INFECTIOUS DISEASES BOARD REVIEW MANUAL

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Tuberculosis Update

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Table of Contents

| | |
|---|----|
| Introduction | 2 |
| General Epidemiology | 2 |
| Diagnosis and Management of Latent Infection | 2 |
| Diagnosis and Management of Active Tuberculosis | 4 |
| Coinfection with <i>Mycobacterium tuberculosis</i> and HIV | 8 |
| Summary | 11 |
| References | 11 |

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Tuberculosis Update

Rocio M. Hurtado, MD, and Joel T. Katz, MD

INTRODUCTION

Despite major therapeutic advances in the 20th century, tuberculosis (TB) continues to be the leading infectious cause of adult mortality worldwide, resulting in an estimated 2 to 3 million deaths per year.¹ Whereas cases of active TB are quite prevalent, latent infection with *Mycobacterium tuberculosis* is even more common; it is estimated that as many as a third of the world's population (or approximately 2 billion people) are currently infected with *M. tuberculosis*.² Moreover, the advent of the HIV/AIDS epidemic, which has inflicted its heaviest burden in areas where TB is endemic, has altered the dynamics of TB. In certain parts of the world, as much as one third of the increased incidence of TB can be attributed to HIV.³

This manual reviews the epidemiology, diagnosis, and management of latent infection with *M. tuberculosis* and of active TB in an attempt to provide a fuller understanding of this disease. Coinfection with *M. tuberculosis* and HIV is also discussed. A case-based format is used on occasion to illustrate major points.

GENERAL EPIDEMIOLOGY

TB is of enormous global concern, given its significant worldwide morbidity and mortality. Approximately 8.7 million cases of TB occur each year throughout the world (**Figure 1**), with the number of TB cases increasing almost 2% per year.⁴ The greatest burden of both *M. tuberculosis* infection and active TB disease is disproportionately borne by the developing world, with 54% of all reported cases occurring in Asia and Africa.¹ Approximately 95% of all cases of TB and more than 98.6% of all TB deaths occur in countries in which TB is endemic and medical services are substandard.⁵

In the United States, it is estimated that 15 million persons are infected with *M. tuberculosis*, comprising a large reservoir from which active TB may develop in ensuing years. A resurgence of TB in the United States occurred between 1985 and 1992, with cases increasing by 20%. This increase has been attributed to several factors, including the HIV/AIDS epidemic, deterioration of the

infrastructure for TB services, immigration of persons from countries where TB is endemic, TB transmission in institutional settings, and the appearance of multidrug-resistant TB. Since 1993, however, the number of reported cases of TB in the United States has been declining. In 2001, a total of only 15,991 cases of TB were reported in all 50 states and the District of Columbia; this figure represented a 2% decrease from 2000 and a 40% decrease from 1992.⁶ The case rate was 5.6 per 100,000 persons, and 50% of cases occurred in foreign-born persons. The proportion of TB cases among foreign-born persons has steadily increased since the mid-1980s. Currently, the TB case rate for foreign-born persons remains at least 4 to 6 times higher than that for persons born in the United States.⁷

In addition, surveillance data have shown that TB in the United States affects racial and ethnic minorities disproportionately. Compared with non-Hispanic white persons, African Americans are 8 times more likely to have TB.⁷ Similarly, Hispanic persons, Native Americans, and Alaskan natives are 5 times more likely and Asians are 16 times more likely to have TB than are non-Hispanic white persons.

The threat of growing multidrug resistance is also of great concern. In the year 2000, an estimated 273,000 (3.2%) of the 8.7 million new TB cases were multidrug resistant,⁸ with higher percentages occurring in areas such as Estonia (14%), Latvia (9%), and the Ivanovo (9%) and Tomsk (7%) provinces in Russia. In 2001 in the United States, the percentage of isoniazid (INH)-resistant strains of TB was 4.5% among those born in the country and 9.6% among those born in foreign countries.^{8,9} The percentage of strains resistant to both INH and rifampin was 0.6% among those born in the United States and 1.4% among those born in foreign countries.

DIAGNOSIS AND MANAGEMENT OF LATENT INFECTION

CASE 1 PRESENTATION

A 45-year-old homeless man goes to a local clinic to establish primary care. He has a prior history of alcoholic liver disease, hypertension, and a seizure disorder for