Detection and treatment of infectious diseases and appropriate patient education are a crucial part of the screening of newly arrived immigrants. This is important for the health of the individual, the family, and the general public. Although some screening will often have taken place before a person’s arrival in the United States, screening methods and infectious disease treatments vary considerably from 1 region to another and deserve a thorough review.

In this article, I discuss the medical history and physical examination in relation to infectious diseases and review specific diseases and topics in more detail. The infectious disease screen is particularly important in situations such as pregnancy or the contemplation of pregnancy, blood donation, and the administration of immunosuppressive medications. Wilson’s A World Guide to Infections, a comprehensive and invaluable reference, should be immensely helpful to any clinician who treats immigrants.

**HISTORY AND PHYSICAL EXAMINATION**

The medical history, preferably conducted in the patient’s primary language, should elicit the country of origin, travel history, and intermediate holding camps or other stops because their epidemiologic characteristics may differ from those of the original region. The patient should be questioned about her menstrual history, family history, medications, transfusions, and past infections, with particular reference to tuberculosis (TB), hepatitis, and parasitic diseases.

Issues of exposure to the human immunodeficiency virus (HIV) and testing are highly culturally sensitive. For some groups of patients, questions regarding HIV infection may best be deferred, preferably until after a therapeutic relationship has been established.

If possible, the clinician should be aware of indigenous treatment practices and the role of traditional healers in the patient’s culture of origin. Injections, bloodletting, or other invasive procedures with the use of unsterilized instruments may contribute to the spread of HIV, hepatitis B, and other blood-borne pathogens. Clinicians should be aware of procedures that may have been performed before arrival in this country, such as female genital mutilation with its attendant risks of pelvic, urinary, and obstetric complications. In addition, a thorough understanding of the patient’s beliefs about healing will facilitate the patients interaction with the American health care system and lead to greater understanding for both the clinician and the new immigrant.

The most common infectious diseases encountered in particular geographic regions are outlined in a table on our web site, www.ewjm.com. Important elements of the medical history and the review of systems are listed in the first box. The history may indicate an urgent need for further evaluation and treatment. Common causes of acute febrile illness in immigrants are malaria; typhoid fever; dengue fever or dengue hemorrhagic fever; typhus; TB; brucellosis; leptospirosis; relapsing fever (borrellosis); influenza; and bacterial pneumonia, urinary tract infection, and other bacterial infections. The physical examination should be thorough, although it need not be lengthy. Key elements are listed in the next box.

**INFECTIOUS DISEASES**

**TB**

TB is highly contagious, particularly when a person with active cavitary disease coughs. The HIV epidemic is closely tied to TB in many parts of the world, and there is growing evidence that TB may accelerate HIV progression and that HIV infection predisposes to the development of active TB. Immigrants account for a significant fraction of
the cases of TB in the United States. In 1989, the overall US TB rate was 9.5 per 100,000 population but 124 per 100,000 for foreign-born persons arriving in the United States.\(^5\) Foreign-born persons accounted for 60% of the total increase in the number of US TB cases from 1986 to 1992.\(^6\) Chest radiographs and sputum smears obtained before arrival should be viewed as preliminary information.

Although persons with active TB ideally would complete a course of effective therapy before arrival in the United States, screening after arrival may turn up more patients with active TB. In addition, the incidence of positive purified-protein derivative (PPD) skin tests is high in immigrants from certain areas; those with inactive or latent disease with a positive skin test are candidates for prophylaxis. In a study of 99 Vietnamese immigrants, 70% were tuberculin-positive, and 39% required anti-TB medication—mostly prophylaxis.\(^7\) The initial screen may not be enough. A study of Tibetan immigrants in Minnesota revealed that this high-risk population (98% of whom had positive PPD tests) had an 8.4% incidence of active TB; about half of the cases were discovered on initial screening, and the other half were diagnosed 10 to 27 months after arrival.\(^8\) However, a review of the current screening system by the Centers for Disease Control and Prevention (CDC) suggests that the system identifies most persons who have active TB at that time.\(^9\)

Current recommendations for screening include a chest radiograph (brought by the patient or newly obtained) and PPD skin testing; sputum smears and speci-
should include at least 2 drugs that she has not received before. The American Thoracic Society-CDC consensus statement provides detailed recommendations about therapy.

Directly observed therapy (DOT), in which patients take medication in the presence of an observer such as a health care professional or government agent, has been shown to greatly increase the rate of completion of TB therapy. This may be particularly important when there are linguistic and cultural barriers to care. Well-designed TB programs can also be a vehicle for health education in general. A model example is a culturally sensitive DOT program in a displaced population in Ethiopia that successfully treated 800 patients with a short-course, 4-drug regimen, with a high rate of completion of therapy. The program increased community morale through education, outreach, and the use of community health workers. A program in Vietnam for prospective migrants bound for the United States screened 39,581 persons, of whom 322 were smear-positive, and achieved an 82% cure rate, again with a short-course, 4-drug DOT regimen. However, many immigrants arriving in the United States will not have had the benefit of such effective screening and treatment before arrival.

TB presents serious problems for some immigrants because of the stigma attached to it in their home countries. Patients may fear the sequelae of testing positive. This is especially so among those from countries where patients with TB are isolated from their families, even long after the initial period of maximum transmissibility.

Hepatitis and liver diseases
Viral hepatitis types A, B, C, D, and E occur with high frequency in certain areas of the world. The effect in terms of chronic disease is most profound for hepatitis B—because of the risk for the development of chronic liver disease in carriers of the hepatitis B surface antigen (HBsAg), the risk for transmission from an infected mother to her neonate, and the risk for hepatocellular carcinoma in long-term carriers. Chronic liver disease due to hepatitis C is also a growing problem worldwide.

In a group of recent Vietnamese immigrants, 14% were HBsAg carriers. A study of Ethiopian immigrants to Israel revealed that serologic evidence for hepatitis B virus (HBV) infection occurred in 35% of 1- to 4-year-olds and reached 98% in those older than 40 years; 19% of children from 1 to 8 years old were positive for HBsAg.

Hepatitis B screening protocols vary from 1 center to another. One strategy is that of the San Francisco General Hospital Refugee Clinic Newcomers’ Program. In this program, all children aged 11 years or younger are immunized against HBV, and an HBsAg test is obtained on all persons aged 12 years and older from countries with intermediate or high prevalence for HBV carriage. Individuals aged 12 to 18 years who are HBsAg-negative are vaccinated. Some centers also test for hepatitis B surface antibody and do not vaccinate those who are positive for the antibody. Those who are HBsAg-positive have liver function tests to detect chronic hepatitis, and an α-fetoprotein level (a marker for the development of hepatocellular carcinoma) is obtained; household contacts are vaccinated and counseled.

It also is important to counsel HBsAg-positive persons, their families, and sexual partners regarding the prevention of transmission, and nonimmune family members and close contacts should be vaccinated. Cultural factors contributing to transmission should be considered. Counseling about transmission should include a discussion of transmission by blood and blood products, intravenous drug use, and sexual relations and such practices as tattooing and ear piercing with shared instruments and sharing needles for legal medications such as insulin and vitamins. Given the development of newer therapies for chronic hepatitis B, such as lamivudine (3TC), the purpose of screening increasingly may include the identification of patients who are candidates for treatment.

Hepatitis A and hepatitis E are primarily enterically transmitted and acute rather than chronic in presentation; many immigrants will already have the hepatitis A anti-
body and thus immunity. Hepatitis D (delta) occurs only in patients who have concomitant hepatitis B, with a frequency ranging from less than 1% to 40% of patients chronically infected with HBV. For certain high-risk persons, such as those from the Amazon Basin, it may be important to consider hepatitis D in HBsAg-positive persons. Hepatitis C is a worldwide cause of chronic liver disease and a major cause of posttransfusion hepatitis. Although therapy with interferon and ribavirin may modify the course of the disease, some screening programs do not routinely include the hepatitis C virus.

Other causes of hepatobiliary problems in immigrants include chronic schistosomiasis (especially due to Schistosoma mansoni) with portal hypertension, opisthorchiasis in Southeast Asian immigrants with late biliary complications and possible cholangiocarcinoma, echinococcosis (the liver is the most common site for hydatid cysts, and these cysts may rupture into the biliary tree or peritoneum), amebic liver abscess, occasional migration of ascariid into the biliary tree, and the ingestion of toxins.

Malaria
Malaria is extremely common in transit and refugee camps; of 279 Somali refugees in 1 study, 15% had malaria parasites detected on blood smears. In many areas of the world, the most serious form, falciparum malaria, is resistant to chloroquine and may be resistant to other antimalarial drugs as well. Treatment should be based on current CDC guidelines and the delineation of areas where resistance occurs. Plasmodium vivax and Plasmodium ovale malaria can persist asymptptomatically in the liver (the exoerythrocytic cycle) and may cause recurrent febrile episodes long after arrival in the United States. Patients with histories of these types of malaria may be candidates for treatment with primaquine, which eradicates this liver cycle. A glucose-6-phosphate dehydrogenase (G6PD) screening test should be performed first because persons with a deficiency of this enzyme can have a severe hemolytic reaction to primaquine. Deficiencies of G6PD are more common in black persons, such as those from the Amazon Basin, it may be necessary screening for an asymptomatic patient. Malaria may be transmitted by blood transfusion, and donors who have traveled from endemic areas are usually excluded for 3 years.

CONCLUSION
Screening for infectious diseases affords the opportunity to detect many treatable and transmissible infections. A thorough knowledge of the infections endemic in the regions of an immigrant’s origin and travels and a sensitivity to cross-cultural issues are helpful in providing immigrants the most appropriate medical care.

References