Infectious Disease Screening for Refugees Resettled in the United States

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Refugees resettling in the United States carry a significant burden of infectious diseases as a result of exposures in their countries of origin and the circumstances of their migration. Overseas screening is required before entry, but it incompletely assesses infectious diseases in refugees. Domestic health assessment has the potential to provide more comprehensive assessment for infectious diseases. Screening protocols ideally should test for tuberculosis, hepatitis B, and intestinal and other parasites and should include mechanisms for providing or updating immunizations. Testing for other infectious diseases, including malaria, hepatitis C, human immunodeficiency virus, and sexually transmitted diseases, can be performed on the basis of clinical signs and symptoms. This article reviews the current status of overseas and domestic health screening for refugees, infectious disease burdens, and future goals for health assessment of refugees and other immigrants.

More than 1.2 million refugees were admitted to the United States during 1989–2002. The number of annual admissions was ∼70,000–119,000 before the 11 September 2001 terrorist attacks but subsequently decreased to <30,000 [1]. Refugees arrive from almost all parts of the world except northern Europe, Australia, New Zealand, and Canada [2]. They may carry a significant infectious disease burden as a result of disease prevalence in their country of origin, exposures during migration, conditions during migration (such as poor nutrition and disruption of health care infrastructure and immunization programs), and exposure to multiple psychological and physical stressors.

As refugees resettle throughout the United States, health care professionals will be called on to assess and treat their medical conditions. Here, I review major infectious diseases in refugees, propose a panel of screening tests, and discuss the rationale for screening for specific infectious diseases.

PREDEPARTURE SCREENING

Refugees are required to undergo health screening before leaving their country of origin or first asylum. Predeparture screening for those ≥15 years of age includes serologic testing for HIV and syphilis and a chest radiograph to assess for evidence of tuberculosis (TB). Documentation of physical examination findings is performed for refugees of all ages. Refugees are not required to receive vaccines before departure, but they will need to show immunization records when applying for permanent resident status. Details of the overseas screening protocol are available from the Centers for Disease Control and Prevention (CDC) [3].

DOMESTIC HEALTH ASSESSMENT

Federal regulations allow for and fund health screening for refugees soon after arrival in the United States. A protocol for medical screening of newly arrived refugees was published by the Office of Refugee Resettlement in 1995, and the protocol serves as an instrument to guide state and local programs in developing screening programs [4]. Several states have developed comprehensive screening protocols that include history, physical examination (including hearing, vision, and dental screening), laboratory screening, mental health screening, immunizations, and an introduction to the US health care system [5–7]. These protocols are designed to identify common infectious diseases and other conditions in refugees, provide treatment and preventive interventions including immunizations, and provide entry into the primary care system, and may serve as models for future standardized screening of refugees in the United States. Individuals caring for refugees are encouraged...
to seek information from state and local health departments about screening available in their area.

INFECTIOUS DISEASES SCREENING

Publicly funded screening programs for refugees are based on a public health approach to infectious diseases. Conditions that can be identified by cost-effective and accurate screening tests, and for which there are interventions to treat or prevent spread of disease, are targeted. Infectious diseases screening recommended for all refugees includes a tuberculin skin test, hepatitis B screening, complete blood cell count, urinalysis, and stool examination for ova and parasites. Table 1 outlines findings on these screening tests and their potential associations with infectious diseases. Testing for additional infectious diseases, such as malaria, HIV infection, sexually transmitted diseases (STDs), hepatitis C, schistosomiasis, filariasis, and strongyloidiasis, may be appropriate for individual patients as standard clinical indications warrant.

TB

The prevalence of TB in the United States reached an all-time low in 2002. At the same time, the proportion of cases of TB among foreign-born individuals in the United States increased from 27% in 1992 to 50% in 2002 [8]. As many as 7 million immigrants residing in the United States may be infected with *Mycobacterium tuberculosis*; 2%–3% of them could develop active disease if not treated. Further reduction in the incidence of TB in the United States relies on identification and treatment of TB in immigrants [9].

Most cases of TB in immigrants are the result of reactivation of infection acquired outside the United States. Longer residence in high-prevalence countries before immigrating to the United States is associated with higher risk of disease, and individuals from these countries may have increased rates of TB for years after arrival in the United States [10]. Disease risk is highest in the first years after arrival, with approximately one-half of cases occurring in the first 5 years [11].

Refugees ≥15 years of age and those <15 years of age with a history of, symptoms of, or possible exposure to TB are screened overseas with a chest radiograph. Sputum microscopy to identify acid-fast bacilli is performed when radiographs suggest active TB. Individuals with active, infectious (sputum-positive) TB are barred from entry until treatment results in a negative culture. Individuals with less active TB upon arrival may enter the United States with the stipulation that follow-up will be performed by US public health authorities in the final resettlement destination.

Refugees ≥6 weeks of age should have a tuberculin skin test (5 TU PPD, read by health professionals in 48–72 h) at the initial health assessment. Results should be recorded as millimeters of induration, measured perpendicular to the long axis of the forearm. A reading of ≥10 mm is considered a positive result for most refugees; a reading of ≥5 mm is considered a positive result for refugees who have known contact with individuals with active TB, who have an abnormal chest radiograph finding, with signs or symptoms suggestive of TB, or who are immunocompromised. If the patient does not return for reading, the skin test should be repeated.

Tuberculin skin testing will identify individuals with latent TB infection (LTBI) who were not screened overseas and will identify LTBI or extrapulmonary TB in those who had normal chest radiograph findings at the predeparture screening. PPD testing can help identify an additional group of individuals with suspected TB identified in the predeparture screening process who have active TB upon arrival. Studies of immigrants and refugees screened overseas by chest radiography and found to have active, smear-negative TB or inactive TB showed that 3.3%–14% of those with active smear-negative TB and 0.4%–3.8% of those with inactive TB were found subsequently to have active disease, defined as having a positive culture for *Mycobacterium tuberculosis* or meeting clinical definitions for active TB [11].

Refugees who have received bacille Calmette-Guérin (BCG) vaccine should receive a tuberculin skin test. Because it is impossible to distinguish a skin test reaction due to infection from a skin test reaction due to BCG, positive skin test results are

<table>
<thead>
<tr>
<th>Test, finding</th>
<th>Associated disease/condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuberculin skin test: positive skin test result</td>
<td>TB; nontuberculous mycobacteria</td>
</tr>
<tr>
<td>Hepatitis B screening</td>
<td></td>
</tr>
<tr>
<td>HBsAb</td>
<td>Immune</td>
</tr>
<tr>
<td>HBsAg</td>
<td>Carrier state, current, or chronic infection</td>
</tr>
<tr>
<td>HBCab</td>
<td>Current or past infection</td>
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<tr>
<td>Complete blood cell count</td>
<td></td>
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<tr>
<td>Low WBC count</td>
<td>HIV infection</td>
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<tr>
<td>Low hemoglobin level or hematocrit</td>
<td>Malaria</td>
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<tr>
<td>Lymphopenia</td>
<td>HIV infection</td>
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<tr>
<td>Eosinophilia</td>
<td>Parasitic diseases (e.g., schistosomiasis, filariasis, and strongyloidiasis)</td>
</tr>
<tr>
<td>Thrombocytopenia</td>
<td>Malaria; HIV infection</td>
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<tr>
<td>Urinalysis</td>
<td></td>
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<tr>
<td>Hematuria</td>
<td>Schistosomiasis</td>
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<tr>
<td>Pyuria</td>
<td>Urinary tract infection; renal TB</td>
</tr>
<tr>
<td>Microscopic evaluation of stool specimens: ova or parasites</td>
<td>See table 2</td>
</tr>
</tbody>
</table>

NOTE. HBCab, antibody to hepatitis B core antigen; HBsAb, antibody to hepatitis B surface antigen; HBsAg, hepatitis B surface antigen; TB, tuberculosis.
interpreted as indicating the possibility of TB infection. Decisions about treatment of LTBI are challenging when positive skin test results occur in refugees from countries with a lower prevalence of TB where BCG is used routinely. Patients from these areas may be aware that a positive skin test result is expected in BCG recipients, and detailed discussion about implications of the positive test result and risks and benefits of treatment is particularly important for these individuals. Refugees who spent time in detention centers, prisons, or refugee camps are at increased risk for TB, compared with those who came to the United States under different circumstances.

The proportion of individuals identified as having LTBI by PPD testing—and who are therefore candidates for therapy—may be substantial. A survey of immigrant and refugee arrivals in San Francisco in 1992–1993 found that nearly 40% of those screened were candidates for treatment. Other programs have reported positive tuberculin skin test results in 49% (Minnesota), 20% (Buffalo, NY), and 35% (Maine) of individuals [12–14].

Diagnosis of TB, whether active disease or LTBI, is often associated with social stigma. Programs able to provide diagnosis, treatment, and long-term follow-up in a refugee’s primary language and with personnel who are aware of the cultural context in which TB is viewed will be most successful. Guidelines for appropriate treatment regimens for LTBI and active TB are available from the CDC, the American Thoracic Society, and the Infectious Diseases Society of America [15, 16]. For most refugees with LTBI treatment with isoniazid will be adequate. Addition of rifampin may be needed for persons who are known to be contacts of individuals infected with isoniazid-resistant strains. The CDC recommends against use of the rifampin-pyrazinamide combination except in rare situations, in which case the patient should be under the care of specialists familiar with adverse events associated with this regimen [15]. In all cases, explanation of adverse events to antituberculous medications should be provided to patients in their native language, with detailed instructions about when to stop use of the medication and when to seek medical care.

Rescreening of refugees for TB after a period of time in the United States is not performed routinely. Some experts recommend considering this practice for internationally adopted children [17]. Although cases of TB develop in refugees months to years after resettlement, data are absent about when to rescreen or efficacy and cost of routine rescreening, compared with current methods of case-finding.

HEPATITIS B

Infection with hepatitis B virus occurs in all refugee groups, with the highest prevalence among refugees from sub-Saharan Africa and East and Southeast Asia [7]. Hepatitis B screening identifies susceptible individuals who can be offered vaccine, and infected individuals who can be evaluated for eligibility for treatment and educated about ways to prevent transmission and reduce further liver damage. Documentation of immunity or vaccination against hepatitis B will be required for application for permanent residency for refugees ≦18 years of age.

Most screening protocols test for hepatitis B surface antigen (HBsAg) and antibody to hepatitis B surface antigen (HBsAb). When HBsAb is present, individuals are considered to be immune, either from past disease or previous immunization. Individuals who have HBsAg have been infected with hepatitis B virus, are carriers and can transmit disease to others, and are at risk for chronic hepatitis B and potential sequelae (cirrhosis and hepatocellular carcinoma). Refugees identified as HBsAg positive will need additional testing and monitoring to identify the stage of their disease and need for treatment, as outlined in a recent treatment algorithm [18]. Testing for hepatitis A and C and provision of hepatitis A vaccine for those who are susceptible are also appropriate for HBsAg-positive individuals.

Some programs also test for antibody to hepatitis B core antigen (HBcAb) [6]. This may be present during a period after infection, when neither HBsAg or HBsAb are detectable. The choice of approach will depend on factors such as cost of screening tests and vaccine and adherence with follow-up for additional testing or doses of vaccine. Retesting in 6–12 months may help clarify the hepatitis B status when screening reveals only HBcAb.

Understanding beliefs about hepatitis B in refugee communities is critical when discussing implications of test results with patients and will facilitate completion of immunizations and compliance with prevention strategies and long-term follow-up [19]. Family members, household contacts, and sexual partners of hepatitis B carriers should be offered hepatitis B vaccine. Information about ways to reduce transmission to household and family contacts should be provided [20].

GASTROINTESTINAL PARASITES

Gastrointestinal parasites are common in refugees, although most individuals are asymptomatic. Intestinal parasites have been identified from all refugee groups, with prevalence ranging from 22% of 2545 refugees arriving in Minnesota during 1999, to 56% of 1254 African refugees screened in Massachusetts during 1995–2001 [12, 21]. Although parasitic infection is thought to be less common in temperate climates than in tropical climates, the conditions under which refugees, compared with other immigrants, have lived before resettlement may place them at increased risk for gastrointestinal parasites. For example, 22% of 252 refugees from Eastern Europe (including Bosnia, Russia, and Macedonia) were found to have parasites [22]. A program of predeparture treatment with albendazole in African refugees began in 1997 with Barawan Somali refugees and was extended to include all refugees (except pregnant...
significant decrease from an initial 64% prevalence of intestinal parasites 6 years earlier. Although there was a significant decrease from an initial 64% prevalence of intestinal parasites, 22% of those rescreened still harbored parasites [24]. Notably, the prevalence of Strongyloides parasites did not decrease. Diagnosis and treatment of Strongyloides infection is important because of the potential for development of hyperinfection syndromes years after infection [25]. Treatment of refugees with albendazole before departure may reduce incidence of Strongyloides infection [26]. Some experts suggest that routine universal treatment of all immigrants with albendazole may be more cost-effective than screening and then treating those with positive results of stool examinations [27]. A limitation of this approach is that albendazole does not treat schistosomiasis, an infection common in refugees from sub-Saharan Africa.

Sources of information about diagnosis and treatment of parasites are available elsewhere [28, 29]. Optimally, antiparasitic medication is provided directly to patients instead of a prescription. Directly observed therapy, especially if treatment is complete in a single dose, can improve adherence to treatment regimens. A list of the most common pathogenic and nonpathogenic gastrointestinal parasites is presented in table 2.

### EOSINOPHILIA

Eosinophilia (absolute eosinophil count, \( \geq 450 \) eosinophil/\( \text{mm}^3 \)) is common in refugees and indicates parasitic infection until proven otherwise. Testing stool samples for presence of ova and parasites is insufficient for diagnosing all parasitic infections associated with eosinophilia and should be paired with serologic or other appropriate testing for other parasites to which the patient may have been exposed.

History and physical examination may reveal signs or symptoms suggesting specific diagnoses, such as itching or skin and eye findings in onchocerciasis, lymphadenopathy or lymphedema in lymphatic filariasis, or hematuria in urinary schistosomiasis [30–32]. Most refugees with eosinophilia will be asymptomatic. Additional testing may include testing of 2 additional stool specimens for those who have had only 1 tested; additional specimens from those who have had 3 examined are unlikely to add significant additional information. Testing for specific parasites can be based on the patient’s possible exposure occurring along the route from country of origin to resettlement in the United States. Testing for antibody to strongyloides is recommended for all refugees with eosinophilia because of the wide geographic distribution and difficulty of identifying strongyloides in stool specimens [7]. Patients who have lived in areas where schistosomiasis is endemic should be tested for presence of antibody to Schistosoma species, unless the diagnosis is made by finding ova in stool or a fresh urine specimen [33]. Lymphatic filariasis (LF), onchocerciasis, and loiasis may occur in refugees from endemic areas. Serologic tests, combined with assessment of clinical signs and symptoms and potential, can help make a specific diagnosis. Other tests might include ex-
Figure 1.  Recommended childhood and adolescent immunization schedule, United States, January through June 2004 [46]

MALARIA

Increasing numbers of refugees are arriving in the United States from areas where malaria is endemic. In the 1990s, challenges associated with diagnosis and treatment of malaria in refugees after arrival led to assessment of overseas strategies that could be used to reduce the number of infected individuals entering the United States [35]. Consequently, predeparture treatment with antimalarial drugs is provided to refugees departing from selected cities, mostly in sub-Saharan Africa. Treatment is not provided to pregnant women or children <2 years of age.

Malaria should always be considered in the differential di-

amination of blood smears, skin snips (for onchocerciasis), eye examination (for onchocerciasis or loiasis), ultrasound (for onchocerciasis or LF) or lymph node biopsy (for LF) [30, 31, 34].
agnosis of fever in refugees from areas where malaria is endemic [36]. Other findings associated with malaria include thrombocytopenia, splenomegaly, or anemia. Blood smears should be examined for malaria parasites when the diagnosis of malaria is considered. Multiple smears may be necessary to identify low levels of parasitemia [37].

**HEPATITIS C**

Universal screening for infection with hepatitis C is not recommended routinely for refugees. Instead, testing for hepatitis C should be based on assessment of risk factors [38].

**HIV INFECTION**

Refugees aged ≥15 years are tested for HIV infection before resettlement. Children aged <15 years are not tested for HIV infection except in high-risk situations, such as having a parent with HIV infection. Individuals diagnosed with HIV infection may be eligible for a waiver to enter the United States; in some states, special programs provide support for these individuals during the resettlement process. For those not tested overseas, routine screening is not recommended, unless indicated by standard clinical criteria.

Disclosing the diagnosis of HIV infection and establishing ongoing care for refugees with HIV infection requires understanding of the cultural context in which this diagnosis will be received. Refugee communities, especially those that are newly established, are often small and close-knit, and maintaining confidentiality may be especially challenging in such a context. Engaging refugees in a program of regular medical care can be a challenging process and may depend on first establishing a trusting relationship with the patient [39]. Refugees may need to be told specifically that the same standard guidelines for treatment of HIV infection used for US-born individuals will be used for assessment and treatment of their HIV infection [40, 41].

**STDs**

Refugees aged ≥15 years are tested for syphilis before resettlement, but no testing is performed for other STDs (except HIV infection). Individuals who received diagnoses of syphilis outside of the United States are eligible for resettlement after treatment. Refugees of any age should be tested if STD infection is suspected (e.g., physical examination findings or person was a victim of rape or sexual abuse). Clinicians can use standard clinical criteria to identify individuals who require testing for specific STDs, keeping in mind that discussion about risk factors should be performed in a context appropriate for newly arrived refugees. The setting of the health assessment is rarely appropriate for performing pelvic examinations or obtaining urethral swabs. Therefore, when signs or symptoms suggestive of STDs are elicited by history or physical examination, use of urine ligase chain reaction to detect gonorrhea and *Chlamydia* infection is most appropriate.

**DENTAL HEALTH**

Dental problems are common in refugees and include caries, abscesses, fistulae, gingivitis, and sequelae of trauma. Surveys of Liberian refugees in Ghana and refugees entering Australia indicate that prevalence of dental caries may exceed 80% in some groups [42, 43]. Dental abnormalities were found in 62% of 1825 refugee children resettled in Massachusetts [44]. Obtaining treatment for dental problems is challenging in the United States, where insurance plans continue to cut reimbursement, and it is increasingly difficult to find dental care covered by public assistance programs. Health care professionals seeing refugees may benefit from developing relationships with local dental practices receptive to treating dental problems in refugees.

**IMMUNIZATIONS**

Most refugees will arrive without immunization records. Documented immunizations may not be up to date according to current US recommendations. Clinicians evaluating refugees should review immunization documents and may accept as valid immunizations provided at ages and intervals acceptable according to US standards. History of disease is not acceptable as proof of immunity except for varicella. Physical examination findings of scars consistent with varicella are also acceptable for documentation of varicella.

Refugees with no records or incomplete immunizations should receive vaccines at the first health assessment visit unless there are contraindications at that time. Sources are available for information about routine and catch-up immunization of children and are presented in figures 1 and 2 [45, 46]. Vaccination schedules for adults are also available [47].

Debate exists about whether screening for antibody to vaccine-preventable diseases should be carried out before immunizing. When follow-up was assured, screening for varicella was more cost-effective than was providing immediate vaccine for individuals ≥5 years of age [48]. Cost-effectiveness data are unavailable for other vaccines. Screening for hepatitis B surface antigen and antibody is used at some sites to identify individuals needing vaccine at the next visit. Other sites favor beginning immunization against hepatitis B at the first visit without waiting for test results because of potential logistical and financial difficulty completing the series and desire to protect susceptible individuals as soon as possible. No formal analyses are available to assess these strategies.

When recommended immunizations cannot be completed within the formal health assessment, patients should be referred to appropriate settings in which to complete recommended
For Children and Adolescents Who Start Late or Who Are >1 Month Behind

The tables below give catch-up schedules and minimum intervals between doses for children who have delayed immunizations. There is no need to restart a vaccine series regardless of the time that has elapsed between doses. Use the chart appropriate for the child’s age.

### Catch-up schedule for children age 4 months through 6 years

<table>
<thead>
<tr>
<th>Dose 1 (Minimum Age)</th>
<th>Minimum Interval Between Doses</th>
<th>Doses 4 to 5 (6 mo)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Dose 1 to Dose 2</td>
<td>Dose 2 to Dose 3</td>
</tr>
<tr>
<td>DTaP (6 wk)</td>
<td>4 wk</td>
<td>4 wk</td>
</tr>
<tr>
<td>IPV (6 wk)</td>
<td>4 wk</td>
<td>4 wk</td>
</tr>
<tr>
<td>HepB&lt;sup&gt;2&lt;/sup&gt; (birth)</td>
<td>4 wk</td>
<td>8 wk</td>
</tr>
<tr>
<td>MMR (12 mo)</td>
<td>4 wk&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
</tr>
<tr>
<td>Varicella (12 mo)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hib&lt;sup&gt;3&lt;/sup&gt; (8 wk)</td>
<td>4 wk: if first dose given at age &lt;12 mo 8 wk (as final dose): if first dose given at age 12-14 mo No further doses needed: all children if first dose given at age ≥15 mo</td>
<td>4 wk&lt;sup&gt;2&lt;/sup&gt;: if current age &lt;12 mo 8 wk (as final dose): if current age ≥12 mo and second dose given at age &lt;15 mo No further doses needed: if previous dose given at age ≥15 mo</td>
</tr>
<tr>
<td>PCV&lt;sup&gt;4&lt;/sup&gt; (6 wk)</td>
<td>4 wk: if first dose given at age &lt;12 mo and current age ≥24 mo 8 wk (as final dose): if first dose given at age ≥12 mo or current age 24-50 mo No further doses needed for healthy children if first dose given at age ≥24 mo</td>
<td>4 wk&lt;sup&gt;2&lt;/sup&gt;: if current age &lt;12 mo 8 wk (as final dose): if current age ≥12 mo No further doses needed: for healthy children if previous dose given at age ≥24 mo</td>
</tr>
</tbody>
</table>

### Catch-up schedule for children age 7 through 18 years

<table>
<thead>
<tr>
<th>Dose 1 to Dose 2</th>
<th>Dose 2 to Dose 3</th>
<th>Dose 3 to Booster Dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Td: 4 wk</td>
<td>Td: 6 mo</td>
<td>Td: 6 mo; if first dose given at age &lt;12 mo and current age ≥11 y 5 y: if first dose given at age ≥12 mo and third dose given at age &lt;7 y and current age ≥11 y 10 y: if third dose given at age ≥17 y</td>
</tr>
<tr>
<td>IPV: 4 wk</td>
<td>IPV: 4 wk</td>
<td></td>
</tr>
<tr>
<td>HepB: 4 wk</td>
<td>HepB: 8 wk (and 16 wk after first dose)</td>
<td></td>
</tr>
<tr>
<td>MMR: 4 wk</td>
<td>Varicella: 4 wk</td>
<td></td>
</tr>
</tbody>
</table>

1. DTaP: The fifth dose is not necessary if the fourth dose was given after the fourth birthday.
2. IPV: For children who received an all-IPV or all-oral poliovirus (OPV) series, a fourth dose is not necessary if third dose was given at age ≥4 years. If both OPV and IPV were given as part of a series, a total of 4 doses should be given, regardless of the child’s current age.
3. HepB: All children and adolescents who have not been immunized against hepatitis B should begin the HepB immunization series during any visit. Providers should make special efforts to immunize children who were born in, or whose parents were born in, areas of the world where hepatitis B virus infection is moderate or highly endemic.
4. MMR: The second dose of MMR is recommended routinely at age 4 to 6 years but may be given earlier if desired.
5. Hib: Vaccine is not generally recommended for children age ≥5 years.
6. Hib: If current age <12 months and the first 2 doses were PRP-OMP (PedvaxHIB or ComVax [Merck]), the third (and final) dose should be given at age 12 to 15 months and at least 8 weeks after the second dose.
7. PCV: Vaccine is not generally recommended for children age ≥5 years.
8. Td: For children age 7 to 10 years, the interval between the third and booster dose is determined by the age when the first dose was given. For adolescents age 11 to 18 years, the interval is determined by the age when the third dose was given.
9. IPV: Vaccine is not generally recommended for persons age ≥18 years.
10. Varicella: Give 2-dose series to all susceptible adolescents age ≥13 years.

**Reporting Adverse Reactions**

Report adverse reactions to vaccines through the federal Vaccine Adverse Event Reporting System. For information on reporting reactions following immunization, please visit [www.vaes.org](http://www.vaes.org) or call the 24-hour national toll-free information line (800) 822-7977.

**Disease Reporting**

Report suspected cases of vaccine-preventable diseases to your state or local health department.

For additional information about vaccines, including precautions and contraindications for immunization and vaccine shortages, please visit the National Immunization Program Web site at [www.cdc.gov/ip](http://www.cdc.gov/ip) or call the National Immunization Information Hotline at 800-232-2522 (English) or 800-232-0233 (Spanish).

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**Figure 2.** Catch-up immunizations for children [47]
vaccines. Refugees applying for permanent resident status will need to present documentation of immunization or of immunity to vaccine-preventable diseases included in Immunization Practices Advisory Committee (ACIP) guidelines.

CONCLUSION

Refugees bear a disproportionate burden of infectious diseases because of the circumstances under which they immigrate to the United States. Screening all refugees with tuberculin skin tests, hepatitis B testing, complete blood cell count, and evaluation of stool samples for ova and parasites can identify infectious diseases with potential for long-term sequelae. Additional testing can be based on clinical signs and symptoms. Future challenges include developing national standardized screening for refugees that is cost-effective, logistically manageable, and applicable to other immigrant groups; collecting and evaluating evidence upon which screening recommendations are based; and developing innovative methods for screening for infectious diseases and immunity to vaccine-preventable diseases.

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