



The refugee medical exam: What you need to do

Refugees arrive in this country with complex medical needs. Here's how best to care for these patients during the initial medical examination, and beyond.

PRACTICE RECOMMENDATIONS

➤ *Use tuberculin skin testing alone or in conjunction with interferon-gamma release assay to screen children younger than 5 years for tuberculosis.* **(A)**

➤ *Include 2 evaluations for ova and parasites plus a complete blood count with differential when screening refugees for parasitic infections.* **(B)**

➤ *Screen all adolescent and adult refugees for human immunodeficiency virus infection.* **(A)**

➤ *Check blood lead levels in all children 6 months to 16 years of age on arrival in the United States and 6 months later.* **(C)**

Strength of recommendation (SOR)

- (A)** Good-quality patient-oriented evidence
- (B)** Inconsistent or limited-quality patient-oriented evidence
- (C)** Consensus, usual practice, opinion, disease-oriented evidence, case series

In 2011, 56,384 refugees fleeing persecution in their native countries were admitted to the United States. The largest numbers came from Burma (30.1%), Bhutan (26.6%), and Iraq (16.7%).¹ They joined the more than 3 million refugees from all over the world who have resettled in this country since 1975.¹

Refugees arrive in the United States with complex medical issues, including illnesses rarely seen here, mental health concerns, and chronic conditions such as diabetes and hypertension. After arrival, they undergo a domestic refugee medical examination (DRME). This DRME, along with well-planned follow-up, can go a long way toward helping refugees show the proof of vaccination and control of chronic health conditions that are required when they apply for lawful permanent resident status.

The Centers for Disease Control and Prevention (CDC) has published guidelines to help with medical decision making and screening of refugees, but limited information is available on the necessary strategies to address chronic health conditions within the context of the DRME.² Moreover, differences in refugee experience and health status based on country of origin may demand more detailed, region-specific guidelines.³⁻⁹ No standard recommendations address the importance of providing not just initial screening, but comprehensive longitudinal care, as well.

Since 2007, our outpatient practice (MA, KS, GM, PM) has performed the DRME and provided ongoing care for more than 900 refugees resettled in Philadelphia. The practice, which is associated with an urban academic medical center and closely coordinates refugee care with a local resettlement agency, has earned recognition as a Level 3 (top-level certification) patient-centered medical home by the National Committee on Quality Assurance. We offer here a framework for providing comprehensive care to refugees, based on CDC guidelines, available evidence, and our experience.

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➤ Because refugees are eligible for only 8 months of medical assistance after arrival in the United States, the domestic refugee medical examination should be done promptly.

Prelude: The overseas medical exam

All refugees must undergo an overseas medical examination (OME) no longer than 12 months before resettlement in the United States. Physicians selected by US Department of State consular officials perform the examinations.

The OME includes a medical history, physical examination, and testing to screen for mental illness, drug abuse, syphilis, leprosy, and tuberculosis (TB). Some vaccinations and empiric treatment for parasites also may be provided at the time of the examination.¹⁰⁻¹²

The OME screens for Class A disorders, which render a refugee ineligible for admission to the United States until treated or stabilized, and Class B conditions, which require close follow-up on arrival (TABLE 1).¹² Despite recent steps toward standardization, the quality and thoroughness of OMEs completed at different examination sites still vary substantially.

Arrival in United States is followed by DRME

When refugees arrive in the United States, they are advised to undergo a DRME, which any licensed practitioner may perform, preferably within 90 days. More rapid evaluation is encouraged for medically complex refugees or refugees arriving with Class A or B conditions. Because refugees are eligible for only 8 months of medical assistance, we strongly recommend that the DRME be done promptly.

The CDC publishes guidelines for components of the initial DRME, but state requirements and individual examinations vary widely.^{2,10,13,14} We outline here the elements of the exam identified by the CDC, supplemented with recommendations based on published evidence and our experiences in caring for refugees.

Screen for tuberculosis

Refugees have a higher prevalence of latent tuberculosis infection (LTBI) and active TB than the general US population. An estimated one-third of the world's population has

LTBI.¹⁵ Since 2002, more than 50% of all people diagnosed with TB in the United States have been born outside the country.¹⁶

Although otherwise healthy adults with LTBI have a lifetime risk of approximately 10% that it will progress to active TB,¹⁷ infants, young children, and people coinfecting with HIV have a rate of progression of around 10% *per year*. It is imperative, therefore, that all refugees be screened for TB and treated appropriately.^{8,18,19}

Refugees are screened for active TB with a chest radiograph and possibly a sputum analysis during the OME. Because screening may take place as long as 12 months before arrival in the United States, refugees may be re-exposed to TB in the refugee camp before departure. They are not screened for LTBI before coming to the United States.^{11,12}

Domestic screening for LTBI is complicated by routine use in many foreign countries of the Bacille Calmette-Guérin (BCG) vaccine, which can reduce the incidence of TB meningitis and disseminated TB in children, but does not protect adults against primary infection or reactivation of TB. Tuberculin skin testing using purified protein derivative, which has typically been used for screening, can render false-positive results, particularly in the context of previous BCG vaccination.

Interferon-gamma release assay (IGRA) is an alternative screening option that has been approved for use in the United States.^{15,20} Because the IGRA is a blood test, it eliminates interpretation errors associated with tuberculin skin testing and is not affected by BCG vaccination. IGRA testing also does not require an additional office visit.

For these reasons, we recommend screening all refugees older than 5 years with IGRAs, where available. In light of scant data and apparent differences in immune response in young children, the CDC recommends using tuberculin skin testing either alone or in conjunction with IGRA testing for all children younger than 5 years.^{20,21}

Positive screening tests *must* be followed up with a chest radiograph. Perform serial sputum evaluation whenever the chest radiograph indicates potential active TB.

Everyone with latent or active TB must

TABLE 1

Overseas medical examination: Class A and B conditions¹²

Class A*	Class B†
Active or infectious tuberculosis	Inactive or noninfectious tuberculosis
Untreated STI: syphilis, gonorrhea, chancroid, granuloma inguinale, or lymphogranuloma venereum	Treated STI
Hansen's disease (leprosy)	Treated or paucibacillary Hansen's disease
Drug or alcohol addiction/abuse	Sustained remission from drug or alcohol addiction or abuse
Mental illness with harmful behavior	Well-controlled mental illness
	Pregnancy

STI, sexually transmitted infection.

* Class A disorders render a refugee ineligible for admission to the United States until he or she is treated or stabilized.

† Class B disorders require close follow-up upon the refugee's arrival in the United States.

be treated according to CDC recommendations adapted from guidelines established by the American Thoracic Society and Infectious Diseases Society of America.^{22,23} For latent TB, the CDC calls for treatment with isoniazid for 9 months or rifampin for 4 months.

- Patients older than 18 years should receive the adult dose of isoniazid: 5 mg/kg per day orally to a maximum daily dose of 300 mg. Children should receive 10 to 20 mg/kg per day orally to a maximum daily dose of 300 mg. Twice weekly therapy schedules are also available and commonly used for children who receive directly observed treatment in school.
- The adult dosage of rifampin (for patients >15 years) is 10 mg/kg per day orally to a maximum daily dose of 600 mg; the pediatric dose is 10 to 20 mg/kg per day orally, also to a maximum daily dose of 600 mg.

Patients taking isoniazid who are pregnant or breastfeeding or have diabetes, renal failure, alcoholism, malnutrition, HIV, or a seizure disorder should receive pyridoxine (vitamin B6) supplementation to aid in preventing peripheral neuropathy, in an adult oral dose of 25 to 50 mg/d or a pediatric oral dose of 6.25 mg/d. Additional information on treating latent TB is available at <http://www.cdc.gov/tb/topic/treatment/ltbi.htm>.

For patients with active TB, treatment is more complex, based on the patient's overall health. Please refer to the

CDC recommendation for the treatment of active TB (<http://www.cdc.gov/tb/topic/treatment/tbdisease.htm>) or contact your local TB control division.

Patients may receive TB treatment from either individual medical providers or city or state health departments, depending on local capacity. In our practice, we treat LTBI in adults. The Philadelphia Department of Public Health's TB Control Program manages LTBI in children and all suspected cases of active TB. We recommend providing everyone treated for latent or active TB with documentation of treatment completion.

Diagnose and treat problematic parasites

Intestinal parasites are among the infections most often found in refugee populations.^{7,8,24-29} Common pathogens in untreated refugees are *Ascaris lumbricoides*, hookworm (*Ancylostoma duodenale* and *Necator americanus*), *Schistosoma* species, *Strongyloides stercoralis*, *Trichuris trichiura*, and *Giardia lamblia*.

Although sustained domestic transmission is unlikely, these parasites may cause growth delay, anemia, hyperinfestation syndrome and disseminated infection (*A lumbricoides* and *S stercoralis*), and increased cancer risk (*Schistosoma hematobium*).⁷ In the late 1990s, the CDC initiated empiric treatment before departure for the United States for *A lumbricoides* (albendazole), *S stercoralis* (ivermectin), *Schistosoma* spe-



Latent tuberculosis is much more likely to progress to active TB in infants, young children, and people coinfecting with HIV than in otherwise healthy adults.

➤ Although sustained domestic transmission is unlikely, intestinal parasites may lead to growth delay, anemia, hyperinfestation syndrome and disseminated infection, and increased cancer risk.

TABLE 2

Empiric treatment of parasites

Refugee region of origin	Organism	Adult therapy
Middle East, South Asia, Southeast Asia	<i>Strongyloides stercoralis</i>	Ivermectin 200 µg/kg/d orally for 2 days
	Other roundworms	Albendazole 400 mg orally, 1 dose
Africa	<i>Schistosoma</i> species	Praziquantel 20 mg/kg orally, 2 doses
	<i>S stercoralis</i>	Ivermectin 200 µg/kg/d orally for 2 days
	Other roundworms	Albendazole 400 mg orally, 1 dose

Source: CDC. Immigrant and Refugee Health: Domestic Intestinal Parasite Guidelines. Available at: <http://www.cdc.gov/immigrantrefugeehealth/guidelines/domestic/intestinal-parasites-domestic.html>. Accessed November 19, 2012.

cies (praziquantel), and other parasites in certain refugee populations, which has decreased but not eliminated the threat.⁷

All refugees should be receiving appropriate predeparture treatment for parasitic infections. For newly arrived refugees who have received no predeparture therapy or incomplete therapy, the CDC recommends screening for parasites or providing presumptive treatment (TABLE 2).

The optimal screening regimen for parasites in refugee populations is controversial. Although most screening programs rely on one or more microscopic examinations of stool for ova and parasites, this test is expensive, requires special handling, depends on the reviewer's expertise, and remains relatively insensitive. A comprehensive review of stool ova and parasites in high-risk populations concluded that the use of 2 independently collected stool samples improved sensitivity at acceptable cost.³⁰

New, more sensitive and specific assays have been developed for many parasites, including *Cryptosporidium parvum*, *Entamoeba histolytica*, *G lamblia*, *S stercoralis*, and *Schistosoma* species, but we do not recommend these specialized tests unless the provider strongly suspects a specific parasite based on history and physical exam or persistent eosinophilia.

■ All refugees should have a complete blood count with differential to help identify occult parasitemia. Although a finding of

eosinophilia may result from successful empiric therapy for an already-treated parasite, it must be followed up with more specific testing for *S stercoralis*, even in otherwise asymptomatic patients. African refugees with eosinophilia also should be tested for *Schistosoma*, and Somali Bantu should be treated empirically for both *S stercoralis* and *Schistosoma*.³¹ In line with CDC guidelines, ongoing failure to identify the cause of eosinophilia in a refugee should prompt referral to an infectious disease specialist and further work-up.

Three to 6 months after antibiotic treatment of any parasite, immunocompromised patients and those with suspected treatment failure should undergo a test of cure comprised of 2 stool ova and parasite studies and a follow-up CBC with differential.³²

Screen for HIV

Since January 4, 2010, after HIV was removed from the Class A diagnosis list, refugees are no longer tested for HIV before arrival in the United States.¹¹ Nevertheless, we recommend screening all refugees on arrival, regardless of age, for HIV types 1 and 2, unless they opt out, for the following reasons:

- approximately 14% of incoming refugees arrive from countries with an HIV prevalence of more than 5%³³
- the increasing use of rape as a tool of torture and repression puts refugees at particular risk for HIV

- current CDC guidelines recommend HIV screening at the time of first encounter in all health care settings for everyone from 13 to 64 years of age and any patient who requests it.³⁴

We also strongly recommend repeat screening 3 to 6 months after resettlement for refugees with recent potential exposure or who engage in high-risk activity.

Watch for ubiquitous hepatitis infection

In accordance with CDC vaccination guidelines and American Association of Pediatrics (AAP) Bright Futures recommendations, we endorse hepatitis A serology testing with reflex vaccination unless immunity is documented for refugees 1 to 18 years of age.^{35,36}

A third of the world's population shows serologic evidence of past infection with hepatitis B virus (HBV); high rates occur in Southeast Asia and sub-Saharan Africa, where most infections are transmitted perinatally.^{37,38} A study of Minnesota refugees found 7% to be positive for hepatitis B surface antigen (HBsAg), with a higher prevalence among refugees from sub-Saharan Africa.⁸

Most screening protocols for refugees test for HBsAg and antibody to hepatitis B surface antigen (HBsAb); it is reasonable to add a screen for antibody to hepatitis B core antigen (HBcAb). We recommend screening for HBV infection using HBsAg, HBsAb, and HBcAb to minimize underdiagnosis in this high-risk population. Refugees without immunity to HBV should be offered vaccination.¹⁸ Encourage immunization, especially for patients with hepatitis or cirrhosis from any cause.

Hepatitis C screening should follow CDC guidelines for the general population, focusing on high-risk groups such as injection drug users, victims of sexual violence, people with multiple sexual partners, recipients of blood transfusions, people with any other type of hepatitis, and one-time screening for individuals born between 1945 and 1965.^{39,40}

Monitor for malaria

Many refugees come to the United States from areas where malaria is endemic.⁴¹ In 2007, the CDC instituted empiric treatment before arrival in the United States for all refugees from

sub-Saharan Africa because the rapid test for malaria approved by the US Food and Drug Administration has low sensitivity and specificity,² malarial vectors are present throughout much of the United States, and malaria (specifically *Plasmodium falciparum*) causes significant morbidity and mortality. If written confirmation of predeparture treatment is not available, refugees from sub-Saharan Africa should receive presumptive treatment, outlined in TABLE 3,⁴² as part of the initial DRME.

Based on our experience and expert opinion, we recommend routinely monitoring all refugees from endemic areas for symptoms of malarial disease during the initial 3 months after resettlement. Relapsing fevers, unexplained malaise or fatigue, pallor, thrombocytopenia, or splenomegaly should trigger additional testing with thick- and thin-blood smears for trophozoites (3 separate samples drawn at 12- to 24-hour intervals).

Be alert for malnutrition

Acute and chronic malnutrition, as well as micronutrient deficiencies, have been noted in refugees coming from refugee camps. A survey of Bhutanese refugees in a camp in Nepal found that 25.1% of children were underweight and 4.8% of them were severely underweight. Moreover, 43.3% of children had anemia.⁴³ Recognizing that refugees may be at high risk for iron deficiency, we recommend evaluating children and adolescents for this deficit according to AAP guidelines.⁴⁴

We also recommend screening body mass index (BMI) to identify refugees at risk. Height, weight, and BMI must be followed over time to ensure appropriate acclimation to the US diet.

Also consider vitamin D deficiency and rickets in refugee populations, particularly people with darker skin and women who wear veils.^{45,46} Based on our experiences and CDC guidelines, we recommend a multivitamin with iron for children 6 to 59 months of age.¹²

Check lead levels in children

Refugee children are at risk of elevated blood lead levels (>10 µg/dL) resulting from predeparture environmental exposure and iron deficiency anemia, which can enhance ab-



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➤
Post-traumatic stress disorder, major depressive disorder, and generalized anxiety disorder are significantly more prevalent among refugees than in the general US population.

TABLE 3

Presumptive postarrival malaria treatment for refugees from sub-Saharan Africa⁴²

Directly observed treatment received in country of origin?	Recommended treatment*	
	Children	Adults
Yes	None	None
No	<p>Atovaquone-proguanil (62.5/25 mg):</p> <p>5-8 kg: 2 tablets per day for 3 days</p> <p>9-10 kg: 3 tablets per day for 3 days</p> <p>Atovaquone-proguanil (250/100 mg):</p> <p>11-20 kg: 1 tablet per day for 3 days</p> <p>21-30 kg: 2 tablets per day for 3 days</p> <p>31-40 kg: 3 tablets per day for 3 days</p> <p>>40 kg: 4 tablets per day for 3 days</p>	<p>Atovaquone-proguanil (250/100 mg):</p> <p>4 tablets per day for 3 days</p>

*Do not presumptively treat pregnant or lactating women or children weighing <5 kg. An infectious disease consult is recommended for these patients.

sorption of lead. Refugees also are more likely to resettle in poor neighborhoods with substandard housing, increasing their risk of domestic lead exposure.

Studies of refugee children at initial screening have shown prevalences of elevated blood lead levels of 6.3% in a Cuban refugee population in Miami and higher rates (11%-22%) in mixed refugee populations in Massachusetts.^{6,47} A study in New Hampshire found that approximately 30% of refugee children with normal lead levels on initial screen had elevated levels when checked several months later.⁴⁸

Consistent with CDC guidelines,⁴⁹ our experience, and the findings of the State of Minnesota,⁵⁰ we recommend checking blood lead levels in all children 6 months to 16 years of age upon arrival in the United States and repeat lead testing 3 to 6 months after placement in a permanent residence.

Bring vaccinations up to date

US law requires anyone seeking an immigrant visa to show proof of vaccination against vaccine-preventable diseases, as recommended by the US Advisory Committee on Immuni-

zation Practices.⁵¹ Vaccination requirements that apply to other immigrant groups do not apply to refugees at the time of their initial admission to the United States, but refugees must be vaccinated when they seek a green card or permanent US residence.

All refugees are eligible for adjustment of status after they have lived in the United States for a year and need proof of vaccination to apply.⁵¹ Moreover, schools may bar refugee children from attending if their vaccinations are not up-to-date, which, in turn, may hinder their parents' ability to find employment. CDC guidelines for vaccinating immigrants and refugees applying for permanent residence are available at <http://www.cdc.gov/immigrantrefugeehealth/pdf/2009-vaccination-technical-instructions.pdf> (see the table on page 12).⁵² Because of the large number of vaccinations required for children and even many adults, health care providers should be familiar with the CDC's recommended immunization and catch-up schedules.³⁵

Vaccinations given in other countries are acceptable if appropriately recorded in Institute of Medicine documentation, or if original vaccination records are available

and the vaccinations conform to appropriate intervals and age guidelines. Refugees must bring their records with them to medical appointments. Laboratory evidence of immunity is acceptable for measles, mumps, rubella (MMR), hepatitis A, hepatitis B, polio, and varicella, but there is debate about whether such testing should be performed before immunization.^{18,53} Health care providers need to assess each patient based on age and risk factors to decide whether immunity testing is appropriate.

In our practice, we routinely test all adults for immunity to varicella, hepatitis A, hepatitis B, and MMR. For children, we rely on documented immunization records, not antibody titers, for evidence of previous vaccination.

Pay attention to mental health issues

Many refugees have been exposed to trauma, often including war and torture, increasing their risk for mental illness. A large 2005 review found that serious mental disorders, including post-traumatic stress disorder (PTSD), major depressive disorder, and generalized anxiety disorder are significantly more prevalent among refugees than the general population.⁵ Many screening tests for PTSD have been proposed⁵⁴ but have not been validated in all immigrant or refugee populations.⁵⁵

Mental health care for refugees is complicated by language and cultural barriers, adjustment disorders, access to psychiatric services, and uncertainty about effective treatments in refugee populations. Despite the higher prevalence of mental illness among refugees, many in the mental health field have raised concerns about the applicability of Western concepts of mental health, including PTSD, in this group.⁵⁶

Refugees who are victims of torture should be referred to experienced mental health practitioners. After ruling out acute psychosis and destructive behaviors, we recommend postponing an exhaustive mental health screening until several months after arrival. In our medical home model, we evaluate patients on an ongoing basis, giving us

an opportunity to identify emerging or worsening mental health conditions.

Evaluate dental health

The incidence of dental caries and periodontal disease among refugees varies widely among different groups of refugees. Data on pediatric refugees in the United States have shown dental caries to be common, with prevalences between 16.7% and 42%, with marked differences based on region of origin.^{3,57,58} In our practice, we also have noted heavy use of betel nut in the Southeast Asian community, leading to significant dental disease.

All refugees should have their dentition evaluated at the initial DRME. We recommend subsequent formal dental examination for all patients, giving priority to those with clear evidence of active disease.

Identify and address chronic disease

Refugees carry a substantial burden of chronic disease, although marked regional variation has been noted.⁴ A study of Massachusetts refugees from 2001 through 2005 demonstrated that 46.8% were overweight or obese, 22.6% had hypertension, and 3.1% had diabetes. Smoking is also highly prevalent in refugee populations.⁵⁹

Our findings confirm high rates of chronic disease, particularly among Iraqi and geriatric refugees. These patients require close follow-up after the DRME to minimize sequelae from chronic conditions. Multidisciplinary teams in the patient-centered medical home may provide an opportunity to promptly address chronic health conditions that can have severe short-term consequences if not adequately managed (eg, insulin dosage adjustment based on diet in patients with diabetes).

We recommend a comprehensive medical history and evaluation for chronic disease, including diabetes and hypertension, at the DRME and on an ongoing basis. Although many refugees have never had any health screening and substantial cultural barriers may exist, especially with regard to women's health and age-based cancer screening, refu-



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TABLE 4

Summary recommendations for the domestic refugee medical exam

History <ul style="list-style-type: none"> Obtain and review predeparture treatment and medical evaluation Encourage sharing of personal narrative (ie, ask about country of origin, countries since fleeing, time in refugee camp, history of torture, "How did you become a refugee?") Perform a review of systems, focusing on infectious diseases and mental health Ask about use of traditional medications or healing practices
Physical exam <p>In addition to the essential components of the physical exam, pay attention to:</p> <ul style="list-style-type: none"> Blood pressure Body mass index Infectious disease: pallor, splenomegaly, jaundice Skin: burns, scars, or other signs of trauma or ritual scarification Genitourinary: female circumcision Dental condition: caries, missing teeth, gingivitis, betel nut use Eyes: undiagnosed vision problems
Initial laboratory evaluation <ul style="list-style-type: none"> CBC with differential Basic metabolic panel (adults only) IGRA testing (or TST if <5 y old) Stool culture (first of 2) Hepatitis B serologies (HBsAg, HBsAb, HBcAb) HIV 1 and 2 antibodies Lead (if ≤16 y old) Titers (adults only): varicella, MMR, hepatitis B Optional: Urinalysis (if concern for <i>Schistosomiasis</i>), thick-and-thin blood smear (if concern for malaria)
Ongoing care <p>Include:</p> <ul style="list-style-type: none"> An introduction to the US health care system Immunizations Sex and age-based cancer screening (eg, mammogram, Pap smear) Chronic disease diagnosis and management Additional routine preventive health measures, including counseling on tobacco and alcohol use

CBC, complete blood count; HIV, human immunodeficiency virus; IGRA, interferon-gamma release assay; MMR, measles, mumps, rubella; TST, tuberculin skin testing.

Adapted from: Centers for Disease Control and Prevention. Immigrant and Refugee Health: Guidelines for the US Domestic Medical Examination for Newly Arriving Refugees. Available at: <http://www.cdc.gov/immigrantrefugeehealth/guidelines/domestic/domestic-guidelines.html>. Accessed November 19, 2012.

gees generally should receive the same preventive care as the rest of the US population until further research has been done in this area.

We recommend introducing age-based cancer screening and other preventive care for refugees within 2 months of their initial visit. This model of care has already been endorsed by the Minnesota Department of Health's Refugee Health Program, one of the leading health care providers for refugees in the United States.⁶⁰

Toward better care models

The medical care of refugees is complex, but the prepared primary care provider can manage it effectively. TABLE 4 summarizes our recommendations for the DRME based on our experiences and the available literature. Standardized screening guidelines and comprehensive programs, perhaps incorporating the concept of the patient-centered medical home, will likely improve both the initial and continuing care of this population.

Ongoing study is essential to better address the health care needs of refugees. Although they comprise only a small segment of immigrants living in the United States, the experience of caring for them may help develop models to provide better care to other foreign-born patients.

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 We recommend introducing age-based cancer screening and other preventive care for refugees within 2 months of their initial visit.

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