

Preventive Health Care And Screening Of Latin American Immigrants In The United States

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Background: The Central and South American immigrant population in the United States is large and growing. A review of the preventive health care needs of this population has not previously been done but would be helpful to clinicians caring for immigrants in this country.

Methods: Using MEDLINE, the literature related to immigrants and their health status was searched, using the key words "immigrant," "refugee," "South/Central/Latin America," "health status," "screening," "nutrition," "parasites," "stomach/gastric cancer," "children," and "psychological." The *American Statistics Index* and *Index to International Statistics* were also resources. The available literature was reviewed and led to the recommendations in this article.

Results: Screening strategies for Latin American immigrants are discussed for intestinal parasites, tuberculosis, hepatitis B, schistosomiasis, leprosy, American trypanosomiasis (Chagas disease), malaria, human immunodeficiency virus (HIV) infection, cervical and gastric cancer, sickle cell trait, malnutrition, iron-deficiency anemia, incomplete immunizations, dental problems, psychological problems, impairment in the elderly, alcohol use, smoking, physical inactivity, and hypertension. There are not enough data to evaluate fully the screening strategies for most of these conditions, but recommendations are offered based on current knowledge.

Conclusions: Screening is recommended for intestinal parasites and schistosomiasis, tuberculosis, hepatitis B in prenatal patients, leprosy in immigrants from high-risk areas, yearly Papanicolaou smears, malnutrition, iron-deficiency anemia, incomplete immunizations, dental problems, history of violence, and depression. Screening for sickle cell trait in prenatal patients from South America and universal hepatitis B screening are less clearly indicated but could be appropriate. Screening for American trypanosomiasis (Chagas disease), malaria, and gastric cancer is not recommended. Screening for HIV infection, functional impairment in the elderly, alcohol use, cigarette smoking, physical inactivity, and hypertension should be the same as for the general population. (J Am Board Fam Pract 1994; 7:310-23.)

Although guidelines for preventive services are well defined for such population groups as children, pregnant women, and the elderly,¹ there is no established standard of care for immigrant groups. Immigrants are epidemiologically a special population. Certain health problems, such as malnutrition and infectious diseases, are known to occur more frequently in immigrants than in the general US population. Many of these conditions can go unrecognized in the course of a cursory medical visit.² Additionally, immigrants from underdeveloped countries might not have received basic preventive care in the past, such as vaccinations.

Immigrants are not a homogenous group. An individual's risk profile varies by country of origin and whether that individual comes from a rural or urban area. With increasing length of stay in the United States, the epidemiology of immigrant groups often becomes more like that of the general US population, but visits to the home country can provide ongoing exposure to exotic diseases. These complexities should be taken into account when providing well-child and routine adult care to new immigrants.

The Public Health Service requires a history and physical examination for all immigrants and refugees before leaving their country of origin. In addition, a chest radiograph is required for all persons aged 15 years and older or a tuberculin test (PPD) for children younger than 15 years who are suspected of having tuberculosis or who have close contact with someone suspected of having tuberculosis.^{3,4} Illegal immigrants, of course, undergo none of these procedures. In the

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United States, screening protocols for immigrants and refugees from Southeast Asia have been developed by local clinics or departments of health and typically include a PPD test, stool test for ova and parasites, hemoglobin or hematocrit measurement, serologic testing for hepatitis B, VDRL test for syphilis, urinalysis, hearing and vision evaluations, and any other tests suggested by the history and physical examination.⁵⁻⁸ Such protocols for Latin American immigrants, however, are difficult to find in the literature.

Hispanics are now second in number only to African-Americans among minority groups in the United States.⁹ The population of Hispanic origin increased from 6.4 percent to 9.0 percent of the total population between 1980 and 1990.⁹ There were more than 914,000 legal Central and South American immigrants between 1981 and 1990 (up 60 percent from the previous decade) and an unknown number of illegal immigrants.⁹ Nevertheless, a review of the literature reveals that the preventive health care needs of Latin American immigrants have not yet been considered in an organized fashion.

In deciding whether to include a screening test in a program of preventive health care, six criteria are generally applied. As outlined by Frame,¹⁰ they are as follows:

1. The condition must have a significant effect on the quality or quantity of life.
2. Acceptable methods of treatment must be available.
3. The condition must have an asymptomatic period during which detection and treatment significantly reduce morbidity and mortality.
4. Treatment in the asymptomatic phase must yield a therapeutic result superior to that obtained by delaying treatment until symptoms appear.
5. Tests that are acceptable to patients must be available at a reasonable cost to detect the condition in the asymptomatic period.
6. The incidence of the condition must be sufficient to justify the cost of screening.

Unfortunately, the data base necessary to evaluate fully screening tests for Latin American immigrants (particularly regarding cost-benefit issues) by and large does not yet exist. Yet primary care clinicians who are caring for immigrants must

choose a course of action despite that lack. This article reviews conditions that are relatively more common in immigrants and discusses whether detection and treatment in the asymptomatic phase can be helpful. Recommendations for screening are offered based on current knowledge. Clearly a fuller evaluation (such as was done by the US Preventive Services Task Force for the general US population) will be needed if the Hispanic immigrant population continues to grow. The suggestions given below are meant to supplement a routine history and physical examination, and of course any abnormal findings not mentioned here should be appropriately pursued.

Methods

MEDLINE searches for articles published from 1980 to 1992 were done using the keywords "immigrant," "refugee," "South/Central/Latin America," "health status," "screening," "nutrition," "parasites," "stomach/gastric cancer," "children," and "psychological." *The American Statistics Index* and the *Index to International Statistics* were searched for articles on American trypanosomiasis (Chagas disease), sickle cell anemia, smoking, alcohol use, cardiovascular disease, and hypertension. The bibliographies of the articles obtained were further sources of information. The available literature was reviewed and led to the recommendations in this article.

Infectious Disease

Intestinal Parasites

One of the more exotic-seeming illnesses to which immigrants are subject is intestinal parasitosis. High prevalence rates for pathogenic intestinal parasites have been reported in Central and South American immigrants. Pathogenic parasites include *Trichuris trichiura* (whipworm), *Ascaris lumbricoides* (roundworm), *Giardia lamblia*, *Entamoeba histolytica*, *Hymenolepis nana*, and hookworm species. Organisms considered nonpathogenic are *Entamoeba coli*, *Endolima nana*, and *Iodamoeba butchii*. From 23 to 50 percent of the population carry intestinal parasites, and 66 to 83 percent of those carrying pathogens are asymptomatic.¹¹⁻¹⁵ Even in Puerto Rico, where the prevalence of parasitosis has declined during the past 30 to 40 years, a considerable number of asymptomatic individuals still harbor intestinal parasites, especially in the more rural areas of the

island.¹⁶ The prevalence of parasitosis can vary by age. In one study of Central American immigrants, the prevalence of *Giardia* was greatest in the 0- to 5-year age group, whereas helminths were most common in the 6- to 10-year age group.¹² Parasitosis was less common overall in older children (>10 years old) and adults, but the rate was still 19 percent.¹² Multiple infestations are common, especially in school-age children.¹¹ Several investigators have also noted that parasitic infestation, usually with the same organism, tends to cluster in families.¹⁷⁻¹⁹ Also, rates of parasitism could be higher in immigrants who have recently traveled to their country of origin.²⁰

There has been some debate regarding how long parasitosis can persist after emigration from the endemic area.²¹ Classically, in the absence of further exposure, helminth infections (except *Strongyloides*) are considered to be self-limited to the life span of the adult worms. Therefore, most immigrants should spontaneously clear their helminths within 3 to 6 years. For example, Salas, et al.¹² found that the prevalence rate of helminths decreased to 0 percent after 3 years of residence in the United States. Chow and Krumholz,⁵ however, found that in refugees from Cambodia (now Kampuchea), the rate of parasitosis did not decrease with a mean length of stay in the US of 2.8 years. They speculated that some continued transmission related to poor hygienic practices might occur in this country. Presumably, refugees do not regularly visit their native country, although this point was not specifically investigated. Similarly, Gyorkos, et al.²² in Canada found that one-third of a group of Kampuchean refugees had persistent or recurrent parasitic infections 6 years after an initial screening and treatment program. Hookworm in particular was found in previously screened individuals 6 years later, even though the average life span for hookworm is only 3 to 5 years.²²

Although helminthic infections can be relatively innocuous, certain intestinal parasites have the potential eventually to cause harm even in asymptomatic hosts. Unfortunately, not enough is known about the natural history of most parasitic infections to arrive at firm figures for the incidence of complications in asymptomatic patients.²² Nevertheless, it is known that asymptomatic patients with *Entamoeba histolytica* risk developing active systemic disease (such as pul-

monary or hepatic abscesses) years later, especially if they receive immunosuppressive therapy.³ *A. lumbricoides* has been estimated to cause intestinal obstruction at a rate of 2 per 1000 infected children per year, which is comparable with the incidence of rheumatic fever resulting from streptococcal pharyngitis (3 per 1000)²³ or the incidence of encephalitis caused by measles (1 per 1000).²⁴ Such intestinal obstruction is estimated to cause death in 6 per 100,000 affected children.²⁴ Intestinal helminths can cause anorexia or malabsorption, which can lead to malnutrition.²⁵ *Ascaris* has been found to be associated with malabsorption and malnutrition in children.^{24,26} Hookworm and whipworm (*T. trichiura*) have also been linked to protein-calorie malnutrition in marginally nourished communities.^{27,28} The fish tapeworm, *Diphyllobothrium latum*, has a high affinity for vitamin B₁₂, and can cause B₁₂ deficiency in otherwise asymptomatic hosts.²⁹ In Finland, where *D. latum* is very common, there is a high incidence of pernicious anemia (0.1 to 2.0 percent).³⁰ *Strongyloides* can persist for years beyond the initial infection through the mechanism of autoreinfection. Because immunosuppression increases the risk of developing hyperinfection and disseminated strongyloidiasis, corticosteroid use can precipitate potentially fatal illness in an asymptomatic infected host.³

Intestinal parasitosis has not generally been considered a public health hazard in the US, with the exception of *Giardia* in the day-care setting.^{31,32} *G. lamblia*, *E. histolytica*, *Taenia solium*, and *S. stercoralis* are transmissible in this country, however, through the fecal-oral route. Because these and *Ascaris* species also have the potential to harm even an apparently healthy host, they should be screened for and treated in asymptomatic patients, especially as safe and effective drug treatment is now available.^{17,33} Based on the comments above, one could also add *D. latum* to the list of organisms for screening. Iralu and Maguire³ believe that all immigrants who need corticosteroids, such as those with asthma, should be evaluated for strongyloidiasis, even if the patient immigrated from an endemic area years ago.³⁴ Hookworm and whipworm are not generally harmful in this country and do not require screening or treatment.^{32,33} Barrett-Connor³⁴ stated that only when hookworm infection causes iron-deficiency anemia is treatment required.

There is much debate on who and how to screen for intestinal parasites. Some authorities have advocated screening all children from endemic areas, if not adults, for ova and parasites.³² This recommendation raises questions of cost-effectiveness given the limited health care resources often available to immigrant communities. Some attempts to address this problem have been made. Barrett-Connor's analysis³⁵ found that screening for intestinal parasites in asymptomatic adult Asian refugees is not cost-effective, even when the prevalence rate is 50 percent. This analysis, however, was limited by the lack of data on the natural history of asymptomatic infection and did not consider the social costs of illness, such as days lost from work. A more comprehensive analysis by Anderson and Moser³⁶ suggested that screening and treatment for intestinal parasites produced a cost-benefit utility ratio well within acceptable limits. Their effort, however, was also limited by the paucity of data on symptoms, hospitalization, and death rates among infected patients. Clearly, more research is needed in this area.

As a screening test for parasitosis, eosinophil count is not reliable in a population with high rates of intestinal parasites, especially with primarily luminal organisms.³⁷ Fitzpatrick, et al.³⁸ found that parasitosis remained common in Indochinese teenagers who had normal eosinophil counts. Similarly, Hoffman, et al.³³ found that only 58 percent of Indochinese refugees with documented intestinal parasitosis had eosinophilia. Stool analysis is therefore the preferred screening method.

To screen with stool analyses, the question then becomes one of sensitivity. Three stool samples are usually recommended for adequate detection of intestinal parasites. Results from a clinic in Framingham, MA, however, showed that successive yields on the second and third stool samples (4.7 to 9.3 percent) were low overall compared with the first sample (24.1 to 39.5 percent).¹¹ Successive yields were even lower (0 to 7 percent) when only therapeutically important results were considered.¹¹ These findings are consistent with the results of a study in Montreal, which found that one screening stool specimen was sufficient for the epidemiological purpose of estimating parasite prevalence.³⁹ These results suggest that one stool sample might be suf-

ficient in some instances as a screening test. Three samples might still be needed, though, for higher risk patients, such as school-age children, those at risk for immunosuppression, and those in contact with immunosuppressed family members.¹¹

In contrast, Hoffman, et al.³³ found that all parasites were detected in the first stool sample in only 69 percent of cases. Further, a study by Lurio and colleagues⁴⁰ of stool testing methods in Cambodian refugees found that cold preserved stool analyses had a sensitivity of only 33 percent relative to their reference standard of purged warm stool (after oral magnesium citrate); thus eight negative preserved samples would be needed to reach a >95 percent negative predictive value in a high-risk population.⁴⁰ Because treatment regimens are generally simple and free of complications, Lurio, et al.⁴⁰ advocated that clinics with large immigrant populations should simply give presumptive treatment to all patients after an initial study period to characterize the parasitic infections common in that population. The regimen they recommended for their patient population would treat adults for hookworm, *T. trichiura*, *A. lumbricoides*, *S. stercoralis*, and *E. histolytica* and would add treatment for *H. nana* and *Giardia* in children 6 to 19 years old.⁴⁰ They would reserve diagnostic testing only for symptomatic patients.⁴⁰

Given the controversies outlined above, the following recommendations seem reasonable. All recent immigrants (with fewer than 5 years in the US) should be screened with at least one stool analysis for ova and parasites. In addition, the families of infected individuals, school-age children, patients with disorders that might require treatment with steroids, those at risk for HIV infection, and those in household contact with immunosuppressed patients should be screened more intensively with three or more stool samples. Patients who have returned from a lengthy visit to their country of origin should be re-screened. Given the relative safety of current regimens, any organism should be treated, including hookworm.

Alternatively, clinics with large immigrant populations might initially screen all immigrants for ova and parasites and then design presumptive treatment programs tailored to the local distribution of parasites.

Tuberculosis

Although Latin American mortality rates from tuberculosis have been gradually declining during the past 20 years, the decline has not been as rapid as was seen in Europe and North America 40 years ago after the introduction of antituberculous chemotherapy. The disease is widespread throughout Latin America and is irregularly distributed within countries. Incomplete data make it difficult to pinpoint high-risk areas within Latin America.

Although rates of reactivity to PPD testing are not available, the mortality rate from tuberculosis is up to two orders of magnitude greater in Latin America than in North America.⁴¹ Estimates of the risk of infection with tuberculosis, which have been inferred from the mortality data, vary from 0.2 to 4.0 percent.⁴¹ Overall, it is estimated that 1.0 to 1.5 percent of the population in Latin America could be infected with *Mycobacterium tuberculosis*, compared with 0.2 percent in North America.⁴¹ Active tuberculosis is most common in the small nations of Central America and in Bolivia and less common in Venezuela.⁴¹ Only Cuba has achieved control of tuberculosis equal to that of the US and Canada.⁴¹ Acquired immunodeficiency syndrome (AIDS) in the US has made tuberculosis once again a serious public health problem here, but the occurrence of tuberculosis is still much greater in Central and South America.

Active tuberculosis among immigrants in this country is more common in recent arrivals and occurs primarily in adults. Most immigrants who develop active disease do so within 5 years of arrival.³

Screening with PPD skin testing is recommended by the Centers for Disease Control (CDC) for all new immigrants.⁴² In addition, children and adolescents, because of a higher lifetime risk of developing active disease, should be rescreened every year.⁴² When screening for PPD reactivity, a history of bacille Calmette-Guérin (BCG) vaccination should be disregarded. BCG vaccination often does not result in a positive skin test, and if a positive reaction is produced, it usually wanes with time³; therefore, a positive reaction cannot be explained by a history of BCG vaccination. Also, because Latin American immigrants have an elevated risk of exposure to tuberculosis, a PPD reaction of 10-mm induration, rather than 15 mm, should be considered

positive in this group.⁴² Treatment of immigrants with positive PPD reactions should follow standard guidelines.⁴²

Hepatitis B

The prevalence of hepatitis B infection in Central and South America is somewhat higher than in the United States. The rate of infection ranges from 0.5 percent in Chile to 8.0 percent in the Amazon river basin.⁴¹ Most countries in the region have rates in the range of 1.0 to 2.5 percent, which compares with a rate of 0.3 percent in the US.⁴¹

In this country a high frequency of hepatitis B carriage is well documented in Southeast Asian immigrants, refugees, and adoptees (from 4 to 21 percent),^{2,5,6,38,43-45} but rates in Latin American immigrants have been found to be much lower, around 1 to 2 percent.^{2,43,44} Rates of up to 17 percent have been found in some small samples, however.⁴⁵

The issue of screening has been discussed primarily in the context of prenatal care. Friedman, et al.⁴⁵ recommended screening all pregnant women for hepatitis B surface antigen when the rate of seropositivity is 1 percent or more (although recently hepatitis B core antibody screening has been recommended for high-risk groups, such as intravenous drug users, prostitutes, institutionalized women, and sexual partners of intravenous drug users or of hepatitis B carriers⁴⁶). An analysis by Arevalo and Washington⁴⁷ found prenatal screening to be cost-effective when the rate of seropositivity exceeds 0.6 percent.

Hepatitis B testing should certainly be done on all prenatal patients, those with a history of hepatitis, and family members or close contacts of previously infected individuals. Given the epidemiologic data, testing of Latin American immigrants in general is reasonable, if resources allow.

Schistosomiasis

Schistosomiasis in the western hemisphere is largely caused by *Schistosoma mansoni*. Prevalence rates vary widely. The highest rates, 3 to 50 percent, are found in the Caribbean.⁴¹ In Brazil the rate is 6 percent, and in Venezuela it is 0.3 percent.⁴¹ The chronic state of schistosomiasis is often asymptomatic, although with time those who have heavy infections can develop hepatosplenic disease as a result of eggs in the venules of

the liver, which provoke a granulomatous reaction and cause intrahepatic presinusoidal obstruction.³⁰ Hepatomegaly and splenomegaly can develop as a result of portal hypertension.³⁰ In severe cases, esophageal varices are formed, although the mortality rate is not nearly as high as in cirrhosis, because the hepatic parenchyma is for the most part undamaged.³⁰ The disease is not transmissible in this country, as suitable snails to serve as the intermediate host are absent.³⁰

Because diagnosis can usually be made by finding eggs in the stool, schistosomiasis can be detected when screening for intestinal parasites is done. Treatment is easily accomplished with one dose of praziquantel.³⁰

Leprosy

Leprosy is endemic in some areas of South America. In French Guiana the incidence rate is 26.8 per 100,000, and in Brazil it is 17.9 per 100,000. Most cases occur in the Amazon region, although in several other countries the rate remains above 2 per 100,000 (several Caribbean islands, including the Dominican Republic and Cuba, Venezuela, Colombia, and Argentina). In the other countries of Central and South America, however, the disease is no longer a serious public health problem.⁴¹ In the US, leprosy should be relatively uncommon in immigrants from Central America.

The disease commonly begins with an asymptomatic hypopigmented macule that can be several centimeters in diameter and can have decreased sensation. This lesion might resolve, or the patient might develop lepromatous or tuberculoid leprosy. The later lesions of lepromatous leprosy are usually not anesthetic or hypopigmented but are bilaterally symmetric patches of diffuse infiltration with a shiny, erythematous surface. Thickened skin and leonine facies can develop. There might be eye lesions, such as punctate keratitis, conjunctival nodules, or iridocyclitis. Tuberculous leprosy is characterized by well-defined, asymmetrical, anesthetic, hypopigmented plaques. Large peripheral nerves can become thickened and palpable. In addition to anesthesia, motor dysfunction can develop.³⁰

Screening can be easily incorporated into a routine physical examination for patients from high-risk areas (Brazil, the Caribbean, Venezuela, Colombia, and Argentina). If the disease is suspected, a diagnosis can be made by slit skin smears

or skin biopsy. Treatment is with dapsone, and physical therapy can help the patient cope with motor and sensory impairments.³⁰

American Trypanosomiasis (Chagas Disease)

American trypanosomiasis, or Chagas disease, is a major public health problem in Central and South America, the more so because it is essentially untreatable.³⁰ Infection with *Trypanosoma cruzi* is endemic throughout nearly all of Central and South America, and overall 4.5 percent of the population is infected. Prevalence rates vary widely, however, from 1.3 percent in Uruguay to 12.5 percent in Argentina. Internal migrations in the past 25 years have changed Chagas disease from a predominantly rural infection to an urban one as well.⁴⁸ In this country among 205 Nicaraguan and Salvadoran immigrants studied in the Washington, DC, area, 10 (4.9 percent) were found to be infected. Six of these were medically examined. All six patients were asymptomatic and had no evidence of cardiac or esophageal disease.⁴⁹

Chronic infection with *T. cruzi* can remain asymptomatic for the patient's lifetime, but up to 36 percent of infected patients will eventually develop symptomatic cardiac, gastrointestinal, or peripheral nervous involvement,⁴⁸ and a minority of patients will develop life-threatening cardiac disease.⁴⁹ The disease causes destruction of autonomic ganglia and myositis by unknown mechanisms. The most frequent manifestations are congestive heart failure, bundle branch blocks and other conduction disturbances, megaesophagus (producing dysphagia and regurgitation), and megacolon (producing constipation).³⁰ Although nifurtimox eliminates circulating forms from the blood, there is no definitive treatment for chronic asymptomatic *T. cruzi* infection. Thus, screening of asymptomatic individuals is not worthwhile.⁵⁰

Further transmission by insect vectors in the US is unlikely, but 2 to 5 percent of infants born to infected mothers will acquire *T. cruzi* as a congenital infection. For neonates with the infection, treatment with nifurtimox can reduce the severity of the illness and eradicate the organism in some cases.⁴⁹ No one has analyzed the risk-benefit ratio for screening *T. cruzi* in prenatal patients, however, or suggested that screening be routinely done. In addition, there is a 12 to 18 percent chance of becoming infected when given infected blood

during transfusion. It is not clear whether this possibility represents a potential public health problem in the US. Kirchhoff, et al.⁴⁹ recommended further studies of the blood supply in areas of the US with large immigrant populations to assess whether transmission of *T. cruzi* through transfusions is a real danger.

Malaria

In the western hemisphere malaria is most common in Central America and the Andean region. Public health measures have decreased malaria incidence sharply: there were 1699 malaria fatalities in 1983, but only 199 deaths in 1988.⁴¹ Malaria in the US is rare. In 1990 there were 558 cases in US civilians, and 504 cases in foreign civilians. Congenital transmission from infected mothers is possible, however, as is transmission through blood transfusion.⁵¹

Because the literature does not describe a prolonged asymptomatic period of malaria infection, and because of its low and declining incidence, screening is probably not warranted. Malaria should be kept in mind, however, when caring for immigrants who develop cycles of fever and chills or unexplained symptoms compatible with malaria, such as diarrhea, abdominal pain, dyspnea, headache, myalgia, or splenomegaly.^{30,32} Malaria is diagnosed through the examination of both thick and thin blood films, treated with Giemsa stain.³⁰

Human Immunodeficiency Virus (HIV) Infection

Although no surveys of the general public in Central and South American countries have been done, rates of HIV infection in certain groups, such as homosexual men and blood donors, have been studied. In general, the rate of infection with HIV in Latin America does not exceed that of the US, with the exception of Haiti. As in the US, homosexual and bisexual men are at increased risk, as are intravenous drug users, hemophiliacs, and the sexual partners of at-risk persons.⁴¹

Immigrants, particularly teenagers, could be at increased risk for acquiring HIV in the United States. Hingson, et al.⁵² found that immigrant teenagers from a variety of ethnic groups in the Boston public schools were less knowledgeable about how HIV is transmitted than were those born in the US. The immigrant teenagers were also more likely to believe that their peers engage in unprotected sex and use intravenous drugs and

were therefore more vulnerable to perceived peer pressure to engage in these behaviors.⁵² A discussion of HIV risk factors should be included in preventive care for all immigrants. Screening, however, should follow standard recommendations.

Noninfectious Disease and Other Health Issues **Cancer**

Despite the prevalence of infectious diseases, malignant neoplasms have become the primary cause of death in Costa Rica, Chile, and Martinique and one of the major causes of death in many other areas.⁴¹ Stomach and lung cancer (affecting predominantly men) and breast and cervical cancer (affecting women) are responsible for the largest proportion of cancer mortality in the region as a whole. Of note, these are predominantly malignancies of lifestyle, related to such factors as smoking, diet, occupation, and sexual activity. Of these malignancies, however, only stomach and cervical cancer occur more often in Latin America than in the US.⁴¹

Few data are available on cancer rates of Central and South American immigrants residing in the United States, but some work has been done with Puerto Ricans. Polednak⁵³ has compared the cancer rates of Puerto Rican-born residents of Connecticut with the rates of cancer in the general population of that state. His data show that men have an increased risk of cancer of the oral cavity, esophagus, and stomach, which also occur at higher rates in Puerto Rico. (There is also an excess risk for leukemia of undetermined cause in the male population.) The Puerto Rican-born women have a lower rate of cancer than the Connecticut-born women, with lower rates of colorectal, lung, breast, and ovarian cancers accounting for the difference. Stomach and cervical cancers are still elevated in these women, however. For immigrant men and women, incidence ratios relative to the US-born fall between 1.77 and 2.91. In general, the immigrants have cancer rates similar to their homeland, with some transition toward higher rates of cancers more frequently seen in the US, such as lung, prostate, and various other gynecological cancers.⁵³ Similar results were found in the Puerto Rican-born population in Long Island, New York.⁵⁴

Some countries in Latin America are instituting gastric cancer screening programs with barium imaging of the upper gastrointestinal tract, simi-

lar to programs in Japan.^{55,56} Although some studies from Japan indicate that screening can reduce mortality, biases and flaws in the available data do not allow researchers to draw firm conclusions about effectiveness.⁵⁵ Consequently, current guidelines do not recommend that gastric cancer screening programs be started in high-risk areas that do not already have these programs. As of 1990 a case-control study of barium radiograph screening was under way in Venezuela,⁵⁵ but clearly even more research in this area is necessary.

Given the above data, cancer screening for immigrants should follow the standard US recommendations for Papanicolaou smears, breast examinations, mammography, and prostate screening. Given the increased risk of cervical cancer, however, Papanicolaou examinations should perhaps be more aggressively recommended to immigrant women. Whereas some authorities have recommended Papanicolaou smears be done every 2 years for many US women, immigrant women should be encouraged to have yearly examinations. Because gastric cancer screening is expensive and the benefits are not yet clear even in high-risk countries, routine barium radiograph examinations cannot be recommended at this time.

Hemoglobinopathies

Because of the mixed genetic heritage of the peoples of Central and South America, it is often difficult to predict an individual's risk of hemoglobin heterozygosity. The birth rate of infants with hemoglobinopathies is 0.51 per 1000 in South America, twice the rate of 0.25 per 1000 found in North America.⁵⁷ Central America has a much lower rate of 0.04 per 1000,⁵⁷ which compares with a rate of 2.5 per 1000 for all sickle disease genotypes in US African-Americans.⁵⁸ In South America, sickle cell disease and sickle-hemoglobin C disease are the most common hemoglobinopathies, with β -thalassemias much less common.⁵⁷ There are no cost-benefit analyses of screening for sickle trait in Latin American immigrants, but given the increased relative risk of South Americans compared with North Americans in general, screening for sickle cell trait could be a reasonable part of preconception and prenatal care. Neonates should be screened for sickle cell disease, which is already routinely done in most states.

Malnutrition and Iron Deficiency Anemia

Malnutrition is more common in Central and South America than it is in the US. Data from the 1980s show that while 4.1 percent of preschoolers in the US were malnourished, the rate of malnutrition elsewhere in the hemisphere was as high as 33 percent.⁴¹ Furthermore, malnutrition in the developing countries of the region disproportionately affects women and female children as a result of patterns of food distribution within the family and the stress of childbearing. When food is scarce, women and especially female children have a lower priority at the dinner table.⁴¹ In addition, women of child-bearing age also must support multiple pregnancies and lactation, which particularly affects their iron and calcium stores. In Central and South America as many as 25 percent of nonpregnant women and 50 percent of pregnant women have iron deficiency anemia.⁴¹ As part of routine health care, weight and height can be easily assessed, and nutrition counseling given. A hemoglobin or hematocrit measurement to check for anemia should be done especially in women and children.

Immunization

Universal immunization is far from realized in Central and South America, although much progress has been made in the last decade. Among children less than 1 year of age, more than 60 percent had received diphtheria, pertussis, tetanus, polio, measles, and BCG vaccines in 1989, up from 20 percent in 1978.⁴¹

In the United States immigrants of all ages should have their immunizations reviewed and brought up to date in accordance with current recommendations. When records are not available, a new primary immunization series should be initiated. One should not forget also to give pneumococcal, influenza, and hepatitis vaccines according to standard recommendations.

Dental Health

Dental health is generally poor in the countries of Central and South America. Data from Argentina show that only 35 percent of 18-year-olds have all their natural teeth, and cavities are almost universal.⁴¹ In the early 1980s, a study of Southeast Asian and Central American immigrant and refugee children in San Francisco found that 77 percent needed dental treatment on the first screening.⁵⁹ In con-

trast, only 25 percent of US-born children surveyed in 1979–1980 required dental treatment.⁶⁰

All immigrants, including children, should have a dental examination. Discussion of dental hygiene can be included in the medical visit.

Mental Health

Much has been written on the psychological problems of immigrants, especially Southeast Asians and refugees. A full treatment of this topic is beyond the scope of this article, but primary care providers should keep in mind that many immigrants have suffered from political persecution, torture, and war before arriving in the US.^{61,62} Psychological suffering can continue in this country for those who view their residence here as exile.⁶³ Illegal immigrants must cope with the constant fear of discovery and deportation. In addition, all immigrants face the more mundane stresses of adapting to a new culture, which some would call cultural bereavement.^{64,65} Depression under these conditions is common, although psychological distress can also become manifest through somatization.^{66,67} Victims of torture, war, or other violence might develop post-traumatic stress disorder.^{68,69}

In addition to the above-mentioned stresses, women from South and Central America often suffer from domestic violence, which is endemic and socially tolerated, or even encouraged, in many Latin American countries.⁴¹ Women who work outside the home are usually still responsible for the household duties and so are subject to the stress of a double workday.⁴¹ These domestic patterns contribute to the high incidence of depression among women in Latin America,⁴¹ and such patterns might well persist after immigration to the US.

Because of the linguistic, financial, and cultural barriers that exist, treatment of psychological disorders is often best accomplished in a system designed especially for the immigrant community.⁷⁰ Such issues as accurate and confidential interpretation and the cultural appropriateness of any proposed treatment, while of concern in ordinary primary care, are especially important here.⁷⁰

All immigrants should be asked whether they have suffered from violence, especially war, torture, or domestic violence. It would also be reasonable to incorporate a brief screening test for depressive symptoms into routine health visits.

Older Immigrants

As Latin America has become more developed, the percentage of the population older than 60 years has increased dramatically. In 1980, 6.5 percent (23.5 million) of Latin Americans were older than 60 years, whereas in 2025 an estimated 12.7 percent (96.6 million) will be.⁴¹ Services for the elderly have generally not been a priority, however, and much social support and long-term care are provided by families, especially daughters.⁴¹

As in the US, older persons are subject to malignant and degenerative diseases, although infectious diseases remain a major cause of mortality.⁴¹ Because of economic and social factors, undiagnosed functional impairment could be more frequent in elderly Latin Americans. Poor eyesight (30 to 50 percent of elderly by self-report) and dentition (up to 33 percent) appear to be very common.⁴¹ The practitioner should be alert for signs and symptoms of undiagnosed impairments. Hearing and vision should be tested according to standard screening recommendations. Social supports, activities of daily living, and the need for services should also be assessed.

Lifestyle Risk Factors

Lifestyle risk factors, such as smoking, alcohol consumption, and physical inactivity, have been shown to be important health threats. Unfortunately, it is difficult to compare data from Latin America directly with that from the United States, because of differences in the survey questions, but some general trends are discernible.

Per capita alcohol consumption in Latin America is lower than in the US.⁷¹ In one study of six Latin American cities, 3 to 15 percent of men and 0 to 3 percent of women admitted to daily alcohol use.⁴¹ Equivalent data from the US is not readily available, but 37.5 percent of the US population admits to having 5 or more drinks on any day.⁹ Unfortunately, these data do not directly address alcoholism.

In Latin America more than one-half of the urban population is sedentary, with higher rates among women (41 to 69 percent of men, 65 to 82 percent of women).⁴¹ In the US, 16.4 percent of the population categorize themselves as less physically active than their peers.⁹ In general, one-half of the urban population of Latin America smokes, with higher rates among men (49 to 69 percent

Table 1. Summary of Health Conditions That Are More Prevalent in Immigrants and Recommended Screening.

Health Problem	Distribution in Latin America or Risk Factors	Detection When Asymptomatic	Treatment When Asymptomatic	Recommended Screening
Intestinal parasites	Geographically widespread. Risk factors include immigration from a rural area, children, extended visit to country of origin, or recent immigration (within 5 years)	Stool analysis for ova and parasites	Specific medical therapy	Stool screening for all immigrants with one specimen. Screening with 3 or more specimens for families of infected patients, school-age children, those at risk for immunosuppression (HIV, steroid use), and those in contact with immunosuppressed patients. Rescreen immigrants who recently revisited their country of origin
Tuberculosis	Geographically widespread except in Cuba	PPD — consider 10 mm of induration positive	Medical therapy	PPD screening of all immigrants. Rescreen children and adolescents yearly
Hepatitis B	Geographically widespread	Blood test for hepatitis B surface antigen. In high-risk groups test for hepatitis B core antibody instead	Prevention of transmission to close contacts; prophylaxis for newborns	Screen all prenatal patients. Consider screening all immigrants
Schistosomiasis	Geographically widespread with highest rates in the Caribbean	Stool analysis for ova	Praziquantel	Screening occurs concurrently when screening for intestinal parasites
Leprosy	Rates are highest in Brazil, the Caribbean, Venezuela, Colombia, and Argentina. Leprosy is uncommon in Central America	Physical examination, followed by slit skin smear if indicated	Dapsone, physical therapy	Incorporate screening into routine physical examinations of immigrants from high-risk areas
Chagas disease	Geographically widespread	Serum analysis	None available	No screening recommended
Malaria	Highest rates found in Central America and the Andes	Generally detected when symptomatic	Chloroquine and other antimalarial drugs	No screening recommended
HIV infection	Outside of Haiti, HIV is not more prevalent than in the US	Blood test for HIV antibodies	Prevention of transmission to close contacts, monitoring of immune function	Screen according to standard recommendations
Cancer of the cervix	Geographically widespread	Papanicolaou smear	Surgical treatment	Yearly Papanicolaou smears for all sexually active women
Cancer of the stomach	Geographically widespread but rates do vary	Barium radiograph of the stomach	Surgical treatment	No screening recommended
Sickle cell trait	Prevalence in South America is higher than in the US, prevalence in Central America is lower than in the US	Screen for sickle cell trait	Genetic counseling	Consider incorporating sickle cell screening into preconception and prenatal care for South American immigrants

Table 1. *Continued.*

Health Problem	Distribution in Latin America or Risk Factors	Detection When Asymptomatic	Treatment When Asymptomatic	Recommended Screening
Malnutrition	Geographically widespread; women and children are especially at risk	Check height and weight	Nutrition education	Screen height and weight of all immigrants
Iron deficiency anemia	Geographically widespread; women and children are especially at risk	Hemoglobin or hematocrit	Iron	Screen all immigrants with a hemoglobin or hematocrit measurement
Incomplete immunizations	Geographically widespread	Review immunization records	Give appropriate immunizations	Review immunization records of all immigrants
Dental health problems	Geographically widespread	Oral examination	Dental hygiene education, referral to a dentist	Brief oral examination, recommend dental visits
Mental health problems, especially depression, somatization, and post-traumatic stress disorder	Widespread but occurrence depends on the immigrant's personal history	History	Appropriate psychological interventions	Ask about a history of suffering from war, torture, domestic, or other violence. Brief screening for depressive symptoms
Undiagnosed functional impairment in the elderly	Probably more common throughout Latin America than in the US	History, physical examination	Interventions appropriate to the condition	Screen according to standard recommendations
Cigarette smoking	Geographically widespread; men are especially at risk	History	Encourage smoking cessation	Screen according to standard recommendations
Physical inactivity	Geographically widespread; women are especially at risk	History	Encourage exercise	Screen according to standard recommendations
Hypertension	Geographically widespread; women are especially at risk	Follow standard recommendations	Follow standard recommendations	Screen according to standard recommendations

HIV=human immunodeficiency virus.

versus 21 to 56 percent for women).⁴¹ In the US, 30 percent of the population uses cigarettes.⁹

It appears that Latin Americans in general drink less, smoke more (especially men), and exercise less (especially women) than in the United States. Of course, habits can shift after immigration, but such data on Latin American immigrants in this country are difficult to find. Preventive health care for immigrants should follow standard recommendations regarding alcohol use, smoking, and exercise.

Cardiovascular Disease

As infectious diseases are slowly subdued, the proportion of deaths that are due to cardiovascular causes has increased sharply.⁴¹ Although cardiovascular diseases are the principal cause of

death in many countries of Latin America, rates have remained below those in the US.⁷²

Hypertension is a common problem in Latin America, especially among women. Data from urban areas show that 7 to 19 percent of men and 18 to 31 percent of women have hypertension.⁴¹ In the US, 9.8 percent of men and 12.8 percent of women report high blood pressure.⁹

In view of the above, screening for cardiovascular disease should follow standard recommendations, which include regular blood pressure measurements.¹

Conclusion

Screening for intestinal parasites and schistosomiasis, tuberculosis, hepatitis B in prenatal patients, leprosy in immigrants from high-risk areas,

malnutrition, iron deficiency anemia, incomplete immunizations, dental problems, history of violence, depression, and yearly Papanicolaou smears are recommended. Screening for sickle cell trait in prenatal patients from South America and universal hepatitis B screening are less clearly indicated but might be appropriate. Screening for Chagas disease, malaria, and gastric cancer is not recommended. Screening for HIV infection, functional impairment in the elderly, alcohol use, cigarette smoking, physical inactivity, and hypertension should be the same as for the general population (Table 1).

We are predominantly a nation of immigrants. Many immigrants eventually become citizens or permanent residents, and any children born here are automatically given US citizenship. Basic primary care, with special attention to the issues discussed above, will help these new members of our society remain healthy and productive.

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