

APPROACH TO MEDICAL ASSESSMENT AND SCREENING FOR NEW REFUGEE AND IMMIGRANT CHILDREN

**Child and Teen Clinic
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BACKGROUND

The term "immigrant children" refers to a diverse group which includes legal immigrants, undocumented immigrants, refugees, and international adoptees. US-born children of immigrant parents are frequently not included in reports on the status immigrant but are likely to have similarly disadvantaged health care status and health risks. For further definitions and discussions about population statistics and obstacles to health care for these families please see separate document: "Background – Definitions and Statistics".

International adoptees likely require even further screening and their parents can benefit from specialized counseling. Please refer to separate guidelines for this group of vulnerable children.

The US immigrant population has undergone tremendous growth over the past decade with the number of foreign-born population increasing by 57% between 1990 and 2000.¹ During the 1990s the US averaged well over a million new immigrants per year, so that by 2000, the foreign-born population exceeded 31 million comprising 11 % of the total U.S. population². Ten percent of Washington's population is foreign born³ with half of the state's 591,000 immigrants and refugees having arrived in the state just in the past decade.

Children of immigrants are the fastest-growing segment of the U.S. population under age 18. In 2005, US welcomed 384,071 legal immigrants as new arrivals including 53,738 refugees, 13,520 asylees, and 22,710 adopted orphans.⁴ In that year, children comprised 36% of the new refugees and 13% of the asylees.⁵ It is now estimated that one in five US children (14 million) is either an immigrant or a member of an immigrant family.⁶ These children comprise a high proportion (28 %) of children in families with incomes less than twice the poverty level.

New immigrant children present a unique set of challenges to healthcare providers. They arrive in the United States with a variety of conditions that may be unfamiliar to practitioners trained in this country. They pose public health risks from both infectious diseases common to the US as well as those more common in their country of origin. These children are at higher risk for unrecognized chronic conditions and infectious disease with long latency periods which can eventually lead to debilitating conditions and death.

In their new setting, immigrant families often lack the concept of a medical home since many are accustomed to an underdeveloped health care system in their prior country residence involving greater use of traditional healers and little direct contact with physicians and nurses. As such, most arrive without records of previous medical care or vaccinations. Furthermore, immigrants, particularly refugees, may have suffered significant physical and psychological stress prior to arriving in the United States. Finally, in addition to be more likely to have fair or poor health and to be challenged by a new language and culture, immigrant children often lack health insurance or a usual source of health care.⁷

Below are guidelines on how to approach health assessment and disease screening in immigrant children newly arrived to the US and/or new to our clinic.

Health Assessments prior to Immigration

Legal immigrants to the US and those being offered resettlement as refugees are required to undergo an overseas medical examination within a year before entry. However, the that examination is generally not comprehensive with the primary focus being on identifying persons with 'excludable conditions' such as active tuberculosis, untreated HIV/AIDS, syphilis and other STDs, untreated Hanson's disease (leprosy), substance abuse, and severe mental illness. Typically no blood work or tuberculosis screening is required for children under 15 years of age.⁸

Children older than 15 and adults are required to have had pre-departure health screening including:

- chest radiograph to screen for pulmonary tuberculosis, (with sputum microscopy for acid-fast bacilli if abnormal),
- examination for sexually transmitted infections
- serologic tests for HIV and syphilis.

Furthermore, given the variety of channels through which people arrive to the US (temporary work visas, student visas, nondocumented) many more may not have undergone any health screening.

In some sites further steps are taken, such as administering vaccinations and empiric courses of anti-parasitic drugs. Sudanese and Bantu Somali refugees, for example, generally receive empiric treatment for schistosomiasis and strongyloidiasis.

Unfortunately, records of any pre-departure health screening or interventions are rarely available at the time that the immigrant child is brought to seek medical care.

THE MEDICAL SCREEN

The purpose of post-arrival domestic medical screening is to reduce health-related barriers affecting the health and well-being of the immigrant children, as well as also to protect the health of the general population from untreated communicable disease. Finally, identifying and correcting immunization deficiencies and other preventive health care serves to protect the health of the child and community.

The routine medical screen for immigrants varies from state to state, and even clinic to clinic. The medical screening protocol for the Child and Teen Clinic (CHT) of Harborview Medical Center is based on available data of health risks, extrapolated literature, clinical experience, and perceived cost-effectiveness. Screening examinations should ideally be tailored to the population being screened including country-specific risk, changing epidemiology, expected morbidity/mortality from untreated conditions, cost-effectiveness, payment sources, and available interventions or treatments.

Medical screening at the CHT clinic for immigrant and refugee children new to the clinic consists of five components:

1. Medical and Travel History
2. Physical examination
3. Screening Laboratory tests

4. Preventive Health interventions, such as immunizations, well-child care, and nutrition counseling
5. Social Work consultation

Appropriate interventions for any medical or mental illness and referral to specialist should be made as necessary. Time taken to explain the importance and expectation of frequent clinic visits in the first few weeks to obtain the necessary laboratory studies and immunizations will help to establish rapport and improve follow-up as the newly arrived family is typically also busy settling into their new home.

Moreover, secondary migration of immigrant families from their original settlement site may further complicate initiation and follow-up of the medical screening process and interrupts continuity of care.

Refugees in the state of Washington are offered a screening history and physical examination, immunization update, and PPD if they contact their Health Department Refugee Screening Clinic (RSC) within 30 days of arrival. Although current guidelines are that an immigrant should have a health assessment within 30 days of arrival in the USA, oftentimes immigrant families arrive at a clinic or emergency room months after arrival without having had any screening tests of medical evaluation completed before arrival to the US. In contrast, international adoptees generally receive medical screening as they are brought to an adoption clinic or their primary care physicians by their adoptive parents.

Please call **206-296-4744** to find if screening tests or evaluations have already been conducted on a refugee child and to obtain faxed copies of records from the King County Health Department Refugee Screening Clinic.

1. Medical History

A medical assessment of an immigrant child should start with a thorough medical history, which should be conducted through a professionally trained interpreter, ideally one with an in-depth knowledge of the immigrant's culture. Use of family members, particularly children, is inappropriate. In addition to the usual points covered in the **medical interview** (e.g. current complaints, past medical history including pregnancy/birth/neonatal history, medications, allergies, and growth, developmental milestones, and environmental screen) the following information should be obtained:

- **Thorough travel history** - including country of origin and countries lived in and traveled through prior to arriving in the US.
- **Immigration status** (visitor, immigrant, refugee, undocumented alien) - can provide clues about prior health screening, as well as physical and mental health risks and barriers to care for the family and child. This information may be collected by the social worker after the medical examination in order to help assure immigrant parents feel that continued medical care will not be impacted by their immigration status.
- **Prior interaction with** modern or traditional **medical practitioners**, including use of herbal or imported medications.
- **Previous surgical or dental procedures or blood product transfusions** – which would place the child at risk of iatrogenic infections such as hepatitis B or C, malaria, and HIV.
- **Experiences with violence, torture, or rape.**

Social and Family history may include:

- Parental and patient educational level

- Parental literacy
- parents' previous employment
- dietary practices
- religious beliefs

Current social circumstances should be cautiously explored, realizing that immigrants may be reluctant to reveal too much for fears of jeopardizing their immigration status or receipt of social services.

Family history should include verification of the caregiver(s) biological relation to the child before inquiring about diseases of concern as it is common for refugee children to be cared for by extended family members, clan members, or family friends.

Medical screening results performed on family members should be reviewed, since any positive results for communicable diseases should be followed-up by related screens on the child.

The choice of appropriate terms may be important to use as major illnesses requiring medications and details of the disease are explored. For example the clinician may inquire about 'yellow jaundice' episodes, typhoid, malaria, or exposures to bad or 'bloody cough' (TB), or "wasting" or slims disease (HIV/AIDS). A teenager from East Africa who had urinary schistosomiasis may deny if you ask about urinary schistosomiasis, but respond positively if asked about bilharzias. Also, a culturally sensitive approach to inquiring about social stigmatized diseases will help to ensure accurate responses.

2. Physical Exam

A thorough physical examination is critical to note previously undiagnosed medical conditions such as fungal infections, cardiac anomalies, organomegaly, and congenital anomalies.

Vision and hearing evaluations is highly recommended for all children, especially in young infants where hearing and visual deficits may not be readily apparent.⁹

Nutritional status should be addressed in all patients and an assessment of growth and development parameters is mandatory. Particular attention should be paid to weight, height and head circumference in children from refugee camps and orphanages, since growth is frequently retarded in these children¹⁰ However, growth and developmental assessment must be interpreted with caution if there is concern that the child's birth date is not accurate, given that many cultures do not keep track of age by the calendar year.

HEENT: tympanic membrane damage or hearing loss, icterus, vision loss, dental decay, presence or absence of a uvula (uvelectomy), multinodular goiter, cervical adenopathy

CHEST: heart murmurs (from valvular disease or anemia), abnormal lung sounds

ABDOMEN: splenomegaly, hepatomegaly, ascites, epigastric pain

GU: STDs, female genital cutting (older teens)

SKIN: rashes, Hansen's disease, prior surgeries, traditional healing (scarification, cupping, coining, burning), serpiginous skin lesion (migrating strongyloides, cutaneous larval migrans)

NEURO: sensory or motor loss, screening for depression, PTSD, sleep disturbance, memory difficulties

3. Laboratory Testing

Laboratory testing of immigrants begins with:

- **TST** – priority should be made to place a tuberculin skin test (TST) with purified protein derivative (PPD) on all immigrants over the age of 6 months if one has not been performed since arrival to the US, regardless of results of prior TSTs performed overseas.

The child's Bacille Calmette Guerin (BCG) vaccine status should not affect interpretation of the PPD test.

Some foreign-born children may have received BCG recently or a TST shortly before immigration. Recent BCG or TST may boost the host response to a subsequent TST. Therefore if children have documentation of a recent TST or evidence of recent BCG, clinicians may consider postponing the TST by one year. The benefits of postponing the TST must be weighed against the risks, of TB and losing the child to follow-up. The TST should not be deferred in children with illness, abnormal chest radiographs or in family members of close contacts with TB.

The AAP recommends considering repeat TST at ages 4 to 6 and 11 to 16 years for those children whose parents immigrated, with unknown skin test status, from endemic regions.¹¹ In addition, the Harborview Child and Teen clinic uses a screening form at well child visits to monitor for risk to TB and to assess need for another repeat TST.

Chest radiography should be performed on any patient with a positive PPD (usually defined as greater than or equal to 10 mm of induration or 5 mm for high risk groups such as recent close contact with an active TB case) or any patients with symptoms of tuberculosis. Note that hilar adenopathy is the more common finding for young children to indicate active TB rather than pulmonary infiltrates.

Also close contacts and family members of children with positive TST are advised to have TST placed.

Evidence: Immigrant and refugees account for roughly 30-50% of tuberculosis burden in the US, with an estimated 7 million foreign-born persons infected with TB in the US. Refugee children are at even higher risk compared with the general immigrant population.^{12, 13} A large study in Massachusetts found a positive PPD reaction in 25% of 1,737 refugee children tested¹⁴, and a study in Minnesota conducted in 1999 found 32% of their refugee children to have positive PPD reactions¹⁵, and still another study of refugee children in Maine found 35.2% of their children to have positive PPD tests.¹⁶

In King county, 75 % of reported cases of active tuberculosis occurred among foreign-born persons with the highest case numbers from Vietnam, Ethiopia, the Philippines, Somalia, and Mexico. The cases from Ethiopia and Somalia were also younger on average, with 50 % of them < 25 years old. The majority of cases from the Philippines, Vietnam and Mexico were older, with just 12 % of persons less than 25 years of age. It is estimated that there are over 100,000 people with latent TB infection in King County.

It is possible for an individual to develop active TB after obtaining a chest x-ray and before emigration. The overseas examination fails to identify people with active extrapulmonary TB not evident on a chest radiograph. This examination also does not routinely include a TST to identify those children < 15 years of age with latent TB infection. In Minnesota, of 156 active TB cases in foreign-born people reported during 1999, none had arrived with prior accurate diagnosis with Class A TB conditions (active pulmonary TB), and only 8% had been classified as having Class B TB conditions (extrapulmonary and non-active TB).¹⁷

- **Hemoglobin and ZPPH** –

These screens identify anemia which is extremely prevalent and often multifactorial involving anemias from nutritional iron deficiency, chronic disease, lead toxicity, and hemoglobinopathies. Often an individual immigrant child will have multiple causes for anemia with the most likely being iron deficiency.

As approximately 40% of Southeast Asian population carry one or more genes for various red blood cell dyscrasia such as alpha-thalassemia, beta-thalassemia, hemoglobin E, and G6PD deficiency; hemoglobinopathies should be considered when anemia is not responding appropriately to iron therapy, and may be investigated through performing CBC with indices and reticulocyte count.

Consideration should be made for to start a screen with CBC indices and reticulocyte count if there is a higher suspicion for thalassemia trait (e.g. family history) in order to diagnosis this condition and provide appropriate family counseling.

Evidence:

Anemia is extremely prevalent in developing countries. Untreated, in young children, iron deficiency with anemia impairs cognitive function and psychomotor development, and has been associated with delayed motor development.

Anemia was found in 12% of 1,247 refugee children examined in Massachusetts, with high prevalence in most regions, varying by age. Of all children in that study younger than 2 years of age 28% were anemic. Another study in Maine found 20% out of 127 refugee children with mild to moderate anemia, none with severe anemia.¹⁸

Sensitivity/Specificity:

Gold standard: bone marrow aspiration or by measuring hemoglobin response to a therapeutic trial of iron.

Ferritin – indicates iron stores, BUT falsely normal in acute/recent infection

Hct or Hgb: Low sensitivity for iron deficiency: 11-60%, high specificity 94% and poor PPV for iron deficiency among children 1-3 years of age. Hemoglobin levels become abnormally low only late in iron deficiency and may also be influenced by overall health status.

ZPPH/Heme ratio (cutoff value of ≥ 69 $\mu\text{mol/mol}$ heme): Sensitivity 80-90% - does not appear to change with acute infection, least expensive, but elevated in several conditions (lead poisoning when $>25\text{mg/dL}$), recurrent infections >2 in 3 months time.¹⁹ ZPPH/H is more sensitive and specific than is hemoglobin in young children, and less affected by thalassemia trait.²⁰

There is a concern that ZPPH/H identifies incorrectly as iron deficient more children with normal iron status than Hgb (Hgb would falsely identify 1 out of 10 kids to be IDA; while ZPPH/H would falsely identify 3 out of 10 to be IDA).²¹ The relative cost-benefit of treating an iron-replete child versus the risk of failing to treat iron-deficient children must be considered.

- **Hepatitis A and B serologies** - Hepatitis A serology should be included in the initial medical screening to avoid an unnecessary vaccine series. Also, many immigrant children travel back to their home country making serologies important to document protection to this infection.

Hepatitis B screening should include:

- Hepatitis B surface antigen (HBsAg)
 - If surface antigen positive, lab should carry out antibody to hepatitis B core antigen (Anti-HBc) to help differentiate between active and chronic state of infection
- Antibody to hepatitis B surface antigen (Anti-HBs)

Patients who are negative for these markers should be vaccinated.

The child found to be a chronic carrier of hepatitis should also be screened for hepatitis D infection, and requires close monitoring and referral for treatment considerations, and further screening (e.g. liver transaminases, serum alpha-fetoprotein levels, liver ultrasound). Patients who are both antigen and antibody negative for hepatitis B should receive routine vaccinations.

Evidence:

Hepatitis A is prevalent throughout the world with a majority of children in developing countries having had the infection and developed immunity by 5 years of age.

Hepatitis B is also extremely common in many parts of the world especially Southeast Asia and Africa. Untreated hepatitis B infection can lead to chronic hepatitis, cirrhosis, and hepatocellular carcinoma .

Six percent of refugee children screened for hepatitis B infection in Minnesota in 1999 were found to be positive. In Maine, 4% of 124 refugee children had positive hepatitis B virus surface antigen and 21% tested positive for hepatitis B surface antibody (mostly those from Africa and Southeast Asia).

The measurement of antibody to core antigen when the surface antigen is negative serves to differentiate between protection conferred due to previous vaccination versus naturally gained immunity – which does not affect medical management decisions. However, in those cases where infection is identified by a positive surface antigen test, core antibody would help to distinguish between active and chronic infection.

Given the high expected prevalence of positive surface antibody, screening for hepatitis B markers before vaccination is more cost-effective than the provision of vaccination without screening. More studies would be required to determine this in our clinic population.

Immigrants with chronic hepatitis B virus infection are at risk for progression to cirrhosis and hepatocellular carcinoma and require additional medical follow-up and counseling, while close contacts and their future infants will require special vaccination.

Consequences if left untreated: HBV leads to chronic infection, chronic liver disease, primary hepatocellular carcinoma, and acute HBV disease.

- **Blood lead levels** – Venous blood lead levels (BLL) should be collected on all refugee children who are 6 months to 16 years of age at entry to the US. Within 3 to 6 months after refugee children are placed in permanent residences, repeat blood lead testing of those refugee children aged 6 months to 6 years should be performed.

As Harborview Social Work estimates that the significant majority of new immigrant families seen at the Child and Teen clinic to be refugee status, BLLs should be conducted on all new immigrant children seen at the clinic.

Confirmed elevated BLL requires one venous test or two elevated capillaries within 12 weeks/80 days of each other, Harborview lab only performs venous tests. Further work-up for elevated BLL should include an evaluation of the child's iron status

After treatment, preschool children with an elevated BLL, should continue neurodevelopmental monitoring long after the child's BLL has been reduced, as many deficits will not manifest themselves until after a child starts school.

Evidence: The prevalence of elevated BLL (BLLs > 10 ug/dL) among newly resettled children is substantially higher than the 2.2% prevalence for US children. In a Maine study of refugee children, 16.7% had elevated BLLs.²² For this reason several US agencies, including the US Department of Health and Human Services, the CDC, the AAP, and the Division of Global Migration and Quarantine have supported this recommendation to screen BLL in all refugee children.^{23, 24}

In many areas of the world, lead-based paints and gasoline and industrial waste containing lead are still common. Lead poisoning is prevalent among children from developing countries, with rates of up to 50%. Newly arrived refugee children are twice as likely as U.S. children to have elevated BLLs with certain sub-populations of refugee children 12-14.5 times more likely to have elevated BLLs.²⁵ Even though refugees may be exposed to lead prior to arriving into the US, data suggest that refugee children are also exposed to lead in this country. For some children, living in the US provides their first exposure to lead.²⁶

Certain cultural practices and behaviors of the refugee population could increase the chance of ingesting lead such as eating off the floor, using lead-containing traditional medicines and cosmetics used from the home country. In addition, a general lack of awareness about the dangers of lead and the need to protect children from known lead hazards along with compromised nutritional status including anemia which can enhance lead absorption further place these families at risk.

The rationale to test refugee children again at 3 to 6 months is best described in the 2005 New Hampshire case study.⁵ This study demonstrated that although some refugee children had elevated BLLs when they arrived in the US, the majority of the children did not. Follow-up screening conducted an average of 60 to 90 days after resettlement into permanent residences revealed elevated BLLs ranging from 11 to 72 µg/dL, providing evidence that lead exposure had occurred in the US.

- **Syphilis screening** – All children from countries where treponemes are known to be endemic, and without documented prior testing, should be screened using RPR at the initial health screening. Please see endnotes for list of countries where *T. pallidum* is endemic.²⁷

When the screening test for syphilis (RPR/VDRL) is positive, regardless of titer, a confirmatory test (e.g., the fluorescent treponemal antibody absorbed test [FTA-ABS] or the *T. pallidum* particle agglutination assay [TP-PA]) should be performed. Note: there is a high false-positive RPR/VDRL in many populations due to other spirochetal diseases.

In children, treponemal infection as indicated by positive screening and confirmatory tests might be caused by

- 1) nonsexual exposure to a person infected with non-venereal *T. pallidum* subspecies,
- 2) congenital transmission from an infected mother (occurs only with syphilis), or
- 3) consensual or nonconsensual sexual exposure (occurs only with syphilis).

An algorithm has been developed to assist in assessment of children from areas with endemic treponematoses with positive screening and treponemal serologic tests (<http://www.cdc.gov/std/syphilis/treponemalalgorithm.pdf>). If the mother's treponemal test is negative, and she reports no history of syphilis, congenital syphilis can be excluded; therefore, testing the mother might be valuable, even if current syphilis infection is not suspected.

Evidence: The CDC recommends that all children from countries where treponemes are known to be endemic be considered for screening by RPR or VDRL at the initial health screening.²⁸

A study of 258 newly arrived African refugees in Melbourne Australia aged 0-62 years found 8% of the population to have reactive Treponema enzyme immunoassay.²⁹

A recently reported case of a Somali teenager being diagnosed with treponemal infection by positive RPR and treponemal test at our Harborview clinic has raised the specter of possible undiagnosed syphilis among our immigrant pediatric population. In the absence of local monitoring statistics, our clinic providers should routinely collect screening information for these children as we begin surveillance for treponemal infections.

Tuberculosis, hepatitis B, and intestinal parasite screening are discussed in more detail below.

Other lab tests to consider:

Urinalysis is an inexpensive way to screen for several conditions. Schistosomiasis hematobium is common in some endemic areas of Africa (reaching rates over 90% in some parts of Nigeria and Ghana) and may present in older children as intermittent asymptomatic gross hematuria, although occasionally it is accompanied by dysuria and frequency.³⁰ Hematuria and proteinuria may be noted by urinalysis, but standard evaluation would include schistosomiasis serology (most sensitive),³¹ although other findings would be serum eosinophilia and positive urine ova and parasites.

Urine check for ova and parasites should be considered for high-risk immigrants who have traveled to areas where schistosomiasis occurs (including Sudan, Kenya, and Ethiopia), particularly if there is a history of skin contact with fresh water from canals, rivers, streams, ponds, or lakes. However, keep in mind that serologies are most sensitive.

G6PD deficiency evaluations should be considered in children from southeast Asia, the Mediterranean, and Africa.

Metabolic screen – newly arrived children with abnormal growth or development may need broad screening for metabolic diseases, including hypothyroidism or rickets. However, the cost of universal metabolic screening is not justified in older children who manifest normal growth and development.³²

Hemoglobinopathy screens may be indicated in high-risk populations, as family genetic counseling may be important for certain diseases such as thalassemias and sickle cell anemia.

HIV screening should be considered for all recent immigrant children over the age of 15 years, any symptomatic child, any high-risk child (e.g. adopted from orphanage or from refugee camps where excessive rates of HIV or syphilis exist as in many African nations and Haiti). A copy of the International Office of Migration (IOM) records is sufficient for documentation unless the child has ongoing symptoms.

- In screening any individual, especially for those from West African countries where HIV-2 is common, both HIV-1 and HIV-2 immunoassays should be ordered. In contemplating ordering a HIV PCR on a newly arrived infant, phone consultation with an infectious disease specialist at CHRMC may be helpful.

Serologies for hepatitis C and *Strongyloides* may also yield positive results among immigrant children coming from countries where these conditions are highly prevalent. These infections have long latency periods (years) and if left untreated can cause serious complications.

4. Preventive Health Assessment and Interventions

Immunizations – All immigrant children require full review of immunization status and catch-up as needed according to CDC guidelines. For young children the questionable dose or vaccines may be repeated. For school-age children, it is more cost-effective to determine serum immunity for the major antigens.³³

Requirement for overseas immunizations among immigrants varies depending on their immigration status and also depends upon the availability of certain vaccines (e.g. Hib vaccines are typically not available in many countries). However, even for those with documented immunizations, the dose may have been administered at too short intervals, at younger ages than recommended in the US, or without adequate immunologic response due to poor quality vaccines.

- **MMR** - Responding to recent information that measles-mumps-rubella ('MMR') vaccines received in other countries likely did not contain rubella vaccine, the Washington State public health department is recommending that children having recorded as having received an MMR overseas should receive a dose of MMR.
- **Varicella titer** – All children over the age of 15 months with no history of varicella infection should be caught up according to the current CDC recommended immunization schedule. For school-age children with unclear history of varicella infection, titers to varicella should be drawn to determine need for catch-up varicella vaccination.

Counseling should be carried out for parents regarding the immunization schedule, importance of routine vaccination, and potential side effects.

Evidence: When varicella-naïve adolescents and adults from tropical areas immigrate to an area where varicella is endemic, they risk exposure to varicella and, because of their age, have a higher chance of significant morbidity and mortality. One study of Somali immigrants found 48% of children under the age of 10 years to be sero-negative for varicella.³⁴ Another study of refugees in Massachusetts found 42% of children under 1 year of age to be seropositive for varicella, likely through natural disease since few were immunized against varicella. Figueira et al demonstrated that it is cost-effective to test children for varicella antibody rather than to immunize if antibody prevalence exceeds 34%.³⁵ The same study noted 96% compliance for second visits to the clinic after availability of serologies to have vaccination when needed.

Studies looking at antibodies for Measles and Rubella also find high seropositivity at young ages. The Massachusetts refugee study (Barnet et al, 2002) found 48% of children under 1 year of age to have measles antibodies, and 58% to have rubella antibodies, which may have been acquired from natural disease, by immunization, or transplacentally. Despite high prevalence of antibody to measles and rubella, serotesting with ELISAs before immunization with MMR vaccine is **not cost-effective** because of the high cost of testing for antibody to 3 antigens, and because of the low cost of the MMR vaccine, as that study notes from analysis done by Plans Rubio.³⁶

Documentation: Data collected by the Minnesota Refugee Health Program for the year 2000 indicate that only 7 (0.3%) of the 2,157 Somali arrivals had documentation indicating they were up to date on basic age-appropriate vaccinations.^{37, 38}

In 1999, 87% of all refugees entering Minnesota had either incomplete or absent documentation of immunization (66% of those 0-5 years old, and 86% of those 6-18 years old)³⁹

Counseling: A series of focus groups of Somali families in Minnesota on the topic of immunizations revealed that Somali parents desire to be educated on immunization regarding the immunization schedule, the importance of vaccine coverage, potential vaccine side effects and how to manage them.⁴⁰ This report recommended providing thorough *oral* immunization information to parents (rather than relying solely on written information) at time of immunization delivery.

Presumptive Treatment for Parasite Infection

Given 1) the high cost and difficulty of collecting the required three stool specimen; and 2) dramatically decreased prevalence of parasite infections noted anecdotally in the last 5 years by healthcare providers (*laboratory data here*) our clinic has been treating for parasite infection presumptively since 1996 with no reported missed cases to date (*reference*). In addition, as the majority of positive stool specimen from refugee studies carried out in the 1990's revealed protozoa infections, the good efficacy of Albendazole to treat *Giardia lamblia* which is the predominant pathogenic parasite and protozoa (81% efficacy with a 3 day course, 95% efficacy for 5 day course) provides evidence that good coverage should be anticipated.⁴¹

High-risk refugees including Sudan and Bantu Somali families should have received presumptive treatment for both Schistosomiasis and Strongyloides (Praziquantel 20 mg/kg in two oral doses 8 hours apart for refugees 4 years and older; and Albendazole 400 mg BID x 7 days for those at least 1 year of age), and will likely not require further treatment unless symptomatic.

Evidence:

Prior to pre-departure presumptive treatment of certain refugee groups from sub-Saharan Africa high rates of infection with pathogenic parasites were noted from a large sample of refugee children examined in Massachusetts, (21% of 1,642 children). That study noted that multiple parasites were often present, particularly from Africa, the Americas, and East Asia. Refugees from the former Soviet Union and former Yugoslavia tended to have *Giardia lamblia* or nonpathogens (such as *Blastocystis hominis*).⁴² Further analysis showed parasite infection to be associated with chronic undernutrition as indicated by stunted physical growth among these children.

A study carried out in Maine of refugee children (primarily consisting of immigrants from East African immigrants, Southeast Asia, and former Yugoslavia and Soviet Union) seen between 1994-1995 at an International Clinic, 43.6% of the 87 children providing stool specimen were found to have evidence of parasites with 50% of these parasites being identified as *Giardia lamblia*. The next prevalent parasite noted was *Trichuris trichiura* (42%) and no *Strongyloides* was found.⁴³ Stool parasites were found in 22% of pediatric refugees in Buffalo,⁴⁴ 35% of Latin American immigrant children seen in Massachusetts,⁴⁵ and 21% of pediatric children in Sweden.⁴⁶

The Maine study of parasitic infections in refugee children measured an overall compliance rate in providing stool specimens to be 67% which is similar to the 61% compliance reported by Bass et al in their study of Latin American children in Massachusetts⁴⁷. In that study, 21% of patients provided 3 specimens, which is slightly higher than the 15% compliance in returning 3 specimen that the Maine study reported.

Developmental Status – Identification of developmental delays is critical for appropriate school placement and should not be delayed ‘until the child learns more English’. Several non-language-based evaluation tools may be useful in the case of limited English proficiency. Brief developmental screens should be included at each clinic visit to initiate monitoring of the child’s development. Delayed development among vulnerable refugee children may be associated with undiagnosed infectious disease, parental depression, and chronic under-nutrition.

Nutrition/ Dietary Knowledge and Practices – Any immigrant child with evidence of chronic undernutrition should undergo further nutrition assessment and counseling, accompanied by a referral to WIC nutrition services. In addition, it is very important to begin discussions about their infant/child feeding practices and understanding of nutrition as they begin to explore the variety of foods available in their new setting.

The Massachusetts study conducted in 1995-1998 reported high rates of refugee children to be physically stunted (height-for-age z scores < -2), predominately among those from Africa (13%), Near Eastern region (19%), and East Asia (30%). As an indicator of acute malnutrition, high rates of wasting (weight-for-height z-scores < -2) were found mainly among African and East Asian refugee children (both 8%).

On the other hand, 6% of this refugee children study population were found to be overweight (weigh-for-age z scores > +2), which was concentrated in young children from the former Yugoslavia and former Soviet Union and the Americas.⁴⁸

Change to new food offerings and lifestyle translates into a diet of over-abundant calories and scarce nutrients for the majority of these immigrants. Attitudes toward food developed in the resource poor settings of their home countries can leave newcomers unprepared to deal with the excess of cheap and readily available junk-food. With the exception of Chinese and Filipinos, Asian immigrant families doubled their proportion of obese children during the transition from first- to second-generation status and the numbers were almost as high for Hispanics.

While immigrant families are at particular risk for the chronic diseases associated with overnutrition, early culturally-sensitive, nutrition counseling has the great potential of preventing poor dietary practices from becoming established habits.

Dental Health – Immigrant children, particularly those who are refugees are at high risk for dental abnormalities, mainly caries. A study of 1,702 refugee children in Massachusetts found 62% of children to have dental abnormalities⁴⁹, and another of 132 newly arrived refugee children in Maine noted dental caries to be the most prevalent finding on physical examination (16.7%).⁵⁰

After assessing dental health and cleaning practices, fluoride varnish should be explained to the parents and applied on the teeth of these high-risk children. Please provide phone numbers and assistance in arranging appointment to dental clinics for further evaluation. Again counseling about the need for dental care will help to assure proper follow-up as many cultures lack education about dental health.

Mental Health – These issues are often difficult to assess due to the language and cultural barriers, particularly during the first clinic visit which is focused on assessing immediate health screening and medical needs. Parents may be unaware of the existence or severity of mental health issues in their children. Oftentimes the refugee parents themselves may have mental health issues.

5. Social Work

Newly arrived immigrant families should have the opportunity to consult with social work during their early visits in order to identify other needs for the families. Information and resources to help the family meet some of their basic needs such as adequate housing, food stamps, immigration status, and continued health insurance coverage, among others may be facilitated through contact with one of the clinic social workers. In addition, social work provides vital family support communicating with the school system for proper academic placement and appropriate level of help for their children.

By serving as the primary coordinator of the many resources available to these vulnerable families the healthcare provider can ensure that they benefit from the centralized, multidisciplinary resources at Harborview in conjunction with professional and cultural mediators during their well child and acute visits.

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⁵ http://www.dhs.gov/xlibrary/assets/statistics/yearbook/2005/OIS_2005_Yearbook.pdf -

children are defined as those under the age of 17 years

⁶ National Research Council and Institute of Medicine, 1998

⁷ **Capps R, Fix ME, Ost J, et al** **The Health and Well-Being of Young Children of Immigrants.** **Urban Institute.** [Hhttp://www.urban.org/url.cfm?ID=311139](http://www.urban.org/url.cfm?ID=311139)

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