

# Health Screening of Newly Resettled Refugees in a Primary Care Setting

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## ABSTRACT

Since October 2008, the Medicine/Pediatrics Primary Care Center (MPPCC) has been working with Rhode Island's refugee resettlement agency to coordinate medical care for newly resettled adults and adolescent refugees. The process includes obtaining extensive screening labs and providing immunizations. This review discusses the results of selected screening tests for latent TB, stool parasites, vitamin D, and vaccine-preventable diseases, such as hepatitis, performed as part of the initial intake exam during the first two years of operation of the MPPCC Refugee Clinic.

**KEYWORDS:** Refugee clinic, TB, hepatitis, Medicine/Pediatrics Primary Care Center

## INTRODUCTION

The federal Refugee Act of 1980 provides for a fixed number of individuals seeking political asylum to relocate to the United States each year, and mandates specific health screenings and evaluations as part of the naturalization process. Since its enactment, more than 4300 refugees have resettled in Rhode Island, including 409 individuals in 2009–2010.<sup>1,2</sup> Refugees are at increased risk of both infectious and non-infectious diseases, which often are not previously addressed, and their vaccination status is typically unknown.<sup>3</sup> An intake exam is required within 30 days of arrival in the United States, or within 7 days for refugees who are HIV positive. Refugees are guaranteed Medicaid insurance coverage for only the first 8 months. Disease burden, limited insurance coverage, and vaccination requirements for naturalization increase the importance of timely diagnosis of conditions, initiation of treatment and referrals, and completion of immunizations.

The Medicine/Pediatrics Primary Care Center (MPPCC), an outpatient residency clinic at Rhode Island Hospital, has worked with the International Institute of Rhode Island (the state's primary refugee resettlement agency), to coordinate the medical care of newly resettled adult and adolescent

refugees since October 2008. Most pediatric refugees are seen at the Pediatric Refugee Intake Clinic at Hasbro Children's Hospital. The intake process occurs monthly in two structured clinic visits. The initial patient encounter is a nurse visit: the patient is oriented to the clinic, a tuberculin skin test (TST) is placed, a brief medical history is obtained and a standardized set of labs is drawn. The list of screening labs is comprehensive and includes: complete blood count with differential, malaria blood smear, urinalysis, vitamin D, glucose and cholesterol, lead (for children ages 6 months to 16 years), urine pregnancy test, HIV, rapid plasma reagin for syphilis, as well as urine for gonorrhea and chlamydia. Titers for hepatitis (A, B, and C), varicella, measles, mumps, and rubella are also obtained. Stool collection containers for the ova and parasite exam are provided to patients at this time and are returned at the intake physical examination two days later. At the intake physical, TSTs are read, stool samples are processed, and lab results are addressed by the resident who will become the patient's primary care provider, thus ensuring continuity of care. Immunizations are initiated at this visit as well.

This review discusses the results of selected screening tests for latent TB, stool parasites, vitamin D, and vaccine-preventable diseases performed as part of the initial intake exam during the first two years of operation of the MPPCC Refugee Clinic.

## METHODS

### Setting/Participants

We performed a retrospective medical record review of all patients who underwent intake exams at the MPPCC Refugee Clinic from October 2008–October 2010.

### Analysis

Demographic data and results of screening tests

were collected from electronic medical records using a structured abstraction tool. Descriptive statistics were generated with SPSS software (version 17.0; SPSS Inc, Chicago, Illinois). This study was reviewed and approved by the Lifespan Rhode Island Hospital Institutional Review Board.



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## RESULTS

During the course of the 23-month study period, 77 patients were seen for care at the MPPCC.

### Demographics

Fifty three percent of the patients were female. Median age was 31 years (range: 4 months to 87 years), with 55% of patients between the ages of 20–39 years (Table 1). Country of origin was similar to national trends of refugee resettlement, with the majority of refugees emigrating from Bhutan, Iraq, Eritrea, Burundi, and Myanmar (formerly Burma) (Table 2).

### Latent Tuberculosis

TST results were available for 95% of patients. Two patients had a history of pulmonary TB and therefore TST was not placed. Latent tuberculosis (TB) infection was diagnosed by TST > 10 mm in 64% of patients. Chest x-ray results were available in the electronic medical record for all but one of the patients with positive TSTs and were all negative for active pulmonary TB. Due to an increased suspicion for TB, two patients were diagnosed with latent TB infection using QuantiFERON (1 with a negative TST, 1 who did not have a TST placed) (Table 3). The latter test was performed at the RISE Clinic, a tuberculosis clinic sponsored by the Rhode Island Department of Health.

### Stool Parasites

Most patients (92%) had their stool examined for ova and parasites. Forty percent of patients had stool samples that were positive for parasites, approximately 2/3 of which were potentially pathogenic. Fourteen patients (18%) had more than one parasite identified (Tables 3 and 4).

**Table 1.** Sex and Age of Patients

Sex	n=77
Female	41 (53%)
Male	36 (47%)
<b>Age range (years)</b> n=77	
0-19	11 (14%)
20-39	42 (55%)
40-59	16 (21%)
≥ 60	8 (10%)

**Table 2.** Region and Country of Origin of Patients at the MPPCC Refugee Clinic (October 2008 to October 2010)

Region (Total No.)	Country	No. of Patients n=77
Central Africa (12)	Burundi	10
	Democratic Republic of Congo (DRC)	2
East Africa (13)	Eritrea	11
	Somalia	2
West Africa (8)	Gambia	1
	Liberia	7
Middle East (13)	Iran	1
	Iraq	12
Southeast Asia (31)	Bhutan	22
	Myanmar (Burma)	9

### Vitamin D

Ninety-five percent of refugees had their vitamin D levels checked. Vitamin D insufficiency (< 30 ng/ml) was detected in 71% of refugees. A striking 88% of refugees from the Middle East had vitamin D deficiency (< 10 ng/ml) (Table 3).

**Table 3.** Results of Selected Screening Tests Among Patients by Region of Origin

Screening Test	Region of Origin					No. of Patients n=77
	Central Africa n=12	East Africa n=13	West Africa n=8	Middle East n=13	Southeast Asia n=31	
<b>TST</b>						
≥ 10mm	6	6	7	7	23	49 (64%)
Not performed	1	1 <sup>a</sup>	0	0	2 <sup>a,b</sup>	4 (5%)
<b>Vitamin D 25 OH</b>						
Insufficient <sup>c</sup>	6	11	3	9 <sup>d</sup>	26 <sup>e</sup>	55 (71%)
Not performed	0	0	0	3	1	4 (5%)
<b>Stool parasites</b>						
Positive	6	8	4	5	8	31 (40%)
Not performed	0	2	1	2	1	6 (8%)

<sup>a</sup> 1 patient with history of pulmonary tuberculosis previously treated  
<sup>b</sup> 1 patient with positive QuantiFERON  
<sup>c</sup> vitamin D 25 OH < 30 ng/ml  
<sup>d</sup> 7 patients with vitamin D 25 OH deficiency w/ levels < 10 ng/ml  
<sup>e</sup> 1 patient with vitamin D 25 OH deficiency w/ levels < 10 ng/ml

**Table 4.** Parasites Found in Screening Stool Specimens<sup>a</sup>

Potentially pathogenic	No. of Patients
Blastocystis hominis <sup>b</sup>	17
Giardia lamblia	8
Dientamoeba fragilis <sup>b</sup>	4
Hymenolepis nana	2
Hookworm	2
Trichuris trichiura	1
Iodamoeba butschlii	1
Entamoeba histolytica	1
<b>Total</b>	<b>36</b>
<b>Nonpathogenic</b>	
Entamoeba coli	9
Endolimax nana	5
Chilomastix mesnili	3
Entamoeba hartmanni	3
Entamoeba dispar	1
<b>Total</b>	<b>21</b>

<sup>a</sup> 14 patients had > than 1 parasite  
<sup>b</sup> pathogenesis is controversial

**Table 5.** Results of Hepatitis B Screening

Hepatitis B immune status <sup>a</sup>	Region of Origin					No. of Patients
	Central Africa	East Africa	West Africa	Middle East	Southeast Asia	
	n=12	n=13	n=8	n=13	n=31	n=77
<b>Immune</b>						
sAb +, cAb -	4	2	0	0	4	10 (13%)
sAb +, cAb+	1	1	4 <sup>b</sup>	0	5	11 (14%)
<b>Non immune</b>						
sAb -, cAb -	6	8	2	12	17	45 (58%)
sAb -, cAb+	1 <sup>c</sup>	2 <sup>b,c</sup>	1	1	4	9 (12%)
<b>Active infection</b>						
sAg +, detectable viral load	0	0	1 <sup>d</sup>	0	1 <sup>d</sup>	2 (3%)

<sup>a</sup> sAb = surface antibody, cAb = core antibody, sAg = surface antigen  
<sup>b</sup> 1 patient with Hep B core IgM consistent with recent infection  
<sup>c</sup> 1 patient with Hep BeAb positive  
<sup>d</sup> patient with Hep B core Ab positive, BeAb positive, with detectable viral load

**Table 6.** Immune Status and Vaccine Documentation of Measles, Mumps, Rubella and Varicella at Intake<sup>a</sup>

	Region of Origin					Total No. of Patients
	Central Africa	East Africa	West Africa	Middle East	Southeast Asia	
	n=12	n=13	n=8	n=13	n=31	n=77
<b>MMR</b>						
Immune	5	12	6	10	22	55 (71%)
Non-immune	1 <sup>b</sup>	0	0	1 <sup>c</sup>	1 <sup>d</sup>	3 (4%)
Not performed	6 <sup>e</sup>	1	2 <sup>f</sup>	2 <sup>g</sup>	8	19 (25%)
<b>Documented MMR Vaccine at Intake</b>	5	1	0	0	8	14 (18%)
<b>Varicella</b>						
Immune	9	8	8	10	30	65 (84%)
Equivocal	0	1	0	2	1	4 (5%)
Non-immune	2	4	0	1	0	7 (9%)
Not performed	1 <sup>e</sup>	0	0	0	0	1 (1%)

<sup>a</sup> immunity defined per Lifespan laboratory guidelines  
<sup>b</sup> patient not immune to measles, but immune to mumps and rubella  
<sup>c</sup> patient not immune to measles and mumps, but immune to rubella  
<sup>d</sup> patient not immune to mumps, but immune to measles and rubella  
<sup>e</sup> 1 patient's age less than recommended for MMR vaccine  
<sup>f</sup> both patients empirically given MMR and varicella vaccine on day of intake, without drawing titers  
<sup>g</sup> 1 patient empirically given MMR and varicella vaccine on day of intake, without drawing titers

**Vaccine Preventable Diseases**

Seventy percent of patients lacked immunity to the hepatitis B virus (HBV) as demonstrated by negative antibody to hepatitis B surface antigen (anti-HBs). Twelve percent had isolated anti-hepatitis B core antibody (anti-HBc) positivity. Two patients had active HBV infection, (anti-HBsAg positivity) with detectable viral loads and were monitored and referred for additional treatment (Table 5). In addition, patients were screened for hepatitis A and C. No patients had active hepatitis A. Two patients had hepatitis C antibodies, but their viral load was undetectable.

Serologic immunity to measles, mumps and rubella was found in 71% of patients. An additional 18% of patients

had documentation of previously administered MMR vaccine. Immunity was assumed in these patients and thus corresponding serologic titers were not drawn. Serologic immunity to varicella was found in 84% of our patients (Table 6).

**DISCUSSION**

Refugee health care is challenging because of issues including diverse cultures and languages, burden of infectious and chronic diseases, naturalization requirements, and limited insurance coverage. The CDC provides guidelines for recommended screening for resettled refugees, which has been further expanded by large refugee health programs.<sup>4,5</sup>

Refugees are often at risk for both the acquisition and secondary transmission of HBV, reflecting the often high prevalence of and under-vaccination for HBV in their country of origin as well as in refugee camps where many have spent years before arriving in the United States. Interestingly, our rates of HBV infection (3%) were lower than those found among refugees resettled in Atlanta (11%) and Minnesota (7%).<sup>6,7</sup> Our results demonstrate that although many of our patients come from endemic HBV regions, definitive immunity as demonstrated by positive surface antibody was low at 27%. Isolated anti-HBc positivity may indicate occult hepatitis infection (with HBsAg below the detectable limits), loss of acquired anti-HBs, or false positivity. Isolated anti-HBc was found in 12% of our sample and exceeds rates previously documented at 7% among resettled refugees in Minnesota.<sup>8</sup> However, when specifically looking among sub-Saharan refugees, our rate of 9% isolated anti-HBc was lower than that found in sub-Saharan African refugees resettled in Australia.<sup>9</sup> Global hepatitis B immunization efforts have focused primarily on infants, therefore adult refugees are still likely to remain unvaccinated and unprotected upon their arrival to the United States. In our clinic, patients lacking anti-HBs-antibody were vaccinated.

Despite high rates of immunity to measles, mumps, rubella and varicella, not all refugees were immune and thus, could serve as source patients or be susceptible in future outbreaks. Susceptibility to a single disease protected by the MMR vaccine was much lower in our clinic (3%) compared to resettled adult refugees in Canada (34%), but similar to measles and rubella susceptibility in refugee children in Boston. Not surprisingly, our adult population had much higher rates of varicella immunity (84%) when compared to this same Boston pediatric refugee population, who showed only a 64% protection rate.<sup>10,11</sup> Given recent outbreaks of

vaccine preventable diseases both domestically and internationally, it is crucial that refugees and other high risk populations are screened appropriately and receive timely immunization.<sup>12</sup> Some refugee clinics have moved to empiric vaccination without checking serologic titers, however the high rates of immunity to measles, mumps, rubella, and varicella among our patients support our current strategy of checking titers prior to immunization.

Over the past 15 years the rates of TB in the United States have been steadily declining with greater than 60% of cases occurring in people who were foreign-born.<sup>13</sup> Seventy-eight percent of active TB cases identified in Rhode Island in 2008 were in foreign-born persons.<sup>14</sup> The importance of proper screening and appropriate treatment of latent, active pulmonary, and non-pulmonary TB is critical to curbing the



**VIDEO** Hasbro Children's Hospital  
Refugee Health Clinic

spread of TB within the United States, especially with increasing rates of multi-drug resistant (MDR) TB worldwide. In our sample, almost all of the refugees diagnosed with latent TB by TST, had documentation of subsequent chest x-rays and proceeded to receive latent TB prophylaxis. This not only decreases individual rates of reactivation TB but also decreases potential secondary transmission to vulnerable communities.

Many of our refugee patients had

potentially pathogenic stool parasites and received parasite-specific treatments. Current CDC guidelines recommend that refugees receive presumptive treatment of intestinal parasites prior to arrival in the United States based on their country of origin. These guidelines were recently changed to include treatment to cover the risks of *Strongyloides* and *Schistosoma* species, which have been shown to be among the most important pathogens with the potential to cause latent and severe infections. However, most of our patients lacked documentation of having received presumptive therapy, and therefore it is unknown whether our

patients benefitted from this intervention. Microbiological examination for ova and parasites has not been shown to be sensitive for *strongyloides* due to varied and intermittent shedding.<sup>15</sup> Serology for *strongyloides* is now recommended by the CDC for all refugees regardless of origin and serology for schistosomiasis for refugees from sub-Saharan Africa.<sup>16</sup> At the time of this review, serology for intestinal parasites was not routinely performed in

our clinic but has now been a recommended change.

Low levels of vitamin D have been described in resettled refugee populations, especially among children and women of childbearing age. Similarly low rates of low vitamin D were noted among Iraqis resettled in both Australia and Massachusetts.<sup>17,18</sup> The high prevalence of vitamin D insufficiency in our Refugee Clinic supports the continued screening and treatment of this condition.

Establishing a structured refugee clinic enabled us to develop a standardized method to identify and treat infections, immunize against vaccine-preventable diseases, and correct nutritional deficiencies. Additionally we provided documentation of immunizations and/or of immunity which is necessary to access education, employment, and naturalization. This structured refugee clinic also benefited from consistent direct communication between health care providers, patients and resettlement agency staff, all of which facilitate our ultimate goal of providing a medical home. Our study was not designed to look specifically at the impact of a structured clinic on the provision of recommended screening; however, its design likely contributed to the high rates of screening coverage.

Recent refugee research in Rhode Island has focused on immunization status, importance of establishing a medical home, and healthcare utilization among pediatric refugees.<sup>19,20</sup> This is the first study to document the results of initial screening in adult and adolescent refugee patients in a primary care setting in Rhode Island. Our refugee population is diverse and will continue to change, reflecting larger international trends of conflict and migration as well as the policies of the federal government. Areas of future investigation suggested by our study include an evaluation of the timeliness of delivery of required vaccines and a cost-benefit analysis of empiric immunization as compared to serologic testing prior to vaccination in adult refugee patients.

#### Acknowledgements

**Funding/Support:** This study was partially supported for Sylvia LaCourse, MD, by Fogarty International Clinical Research Scholars and Fellows Program at Vanderbilt University (R24 TW007988) and for Natasha Ryback, MD, by a T32 Research Fellow Grant, Lifespan/Tufts/Brown Center for AIDS Research, NIH- 5T32AI007438. **Additional Contributions:** We gratefully acknowledge the clinic staff and interpreters for their efforts to improve refugee health at the MPPCC.

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## Disclosures

The authors have no disclosures.

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