



# Haiti Health Initiative

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March 2012 Mission to Timo, Haiti

Ophthalmological Report

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## INTRODUCTION

Since the March 2012 trip was the first effort by HHI to provide ophthalmologic care to Timo, our work was in many ways investigational. We were aware of several patients with significant ophthalmologic problems that had been encountered by the previous medical teams, but had no idea as to the prevalence of other eye diseases, and were uncertain as to which of the possible ocular disease states would prove amenable to treatment in a rural setting. We therefore approached this trip as an opportunity to provide basic eye care while at the same time making an assessment of the most pressing ophthalmologic needs of the community in preparation for future trips. Our specific goals were these,

1. **Begin preparation for surgery in the future.** One ocular disease state that had been reported by the previous medical teams in Timo was cataract. While cataracts are the leading cause of functional blindness among the elderly in nearly all nations other than the United States, we knew that safely performing cataract surgery in such primitive conditions would be difficult, and decided against attempting any intra-ocular surgery on this initial visit. We were, however, determined to begin preparations for surgical ophthalmology efforts in the future by establishing a relationship with other nearby facilities where intra-ocular surgery could later be performed, in addition to identifying potential surgical candidates for future efforts.



2. **Provide reading glasses.** Knowing that presbyopia (near vision difficulties due to lens changes with age) is prevalent in any population, and that the related condition hyperopia is more common than myopia in most African-descent populations, providing the local community with reading glasses seemed a reasonable and viable goal.
3. **Perform extra-ocular surgeries, if needed.** We also came prepared with equipment and supplies for performing extra-ocular surgeries if the opportunity presented itself, and brought a variety of topical ocular medications to hopefully enable us to treat most ocular diseases that we might encounter. For example, one ocular disease that is found in higher incidence in some African-descent populations is glaucoma, so we came prepared to diagnose and treat this condition.
4. **Initiate school vision screening programs.** One other goal for this trip was that of providing eye charts and training local school officials to do vision screening of school-age children; this was done in an attempt to identify children at risk for amblyopia and other pediatric ophthalmologic diseases at an age where intervention could be effective.
5. **Find local partners to continue ophthalmologic efforts.** The final goal for ophthalmology on this trip was to identify local individuals who could be trained to continue simple screening and provide basic ophthalmologic care to the local residents in our absence.

## REVIEW OF ACTIVITIES AND RESULTS

### Statistics

Number of days worked: 5

Number of ophthalmologists: 1

Number of local medical assistants/translators: 2

Number of patients seen by ophthalmology: 212

Number of patients receiving vision screening in triage and not referred to ophthalmology: 192 (Including 4 patients that probably should have been referred but were not, and 1 referred patient that never returned to see ophthalmology)

Number of prescription glasses given to patients on site: 5

Number of prescriptions for glasses to be made post-trip and mailed back to patients: 4

Number of pre-made reading glasses given to patients on site: 104

Number of pre-made reading glasses to be sent back to patients: 7

(Note: These statistics do not include the work we did at the orphanage.)

### Clinical findings

Cataracts:

Early/moderate level: 35 patients

Surgical level: 31 patients

Pterygium: 12 patients

Dry eye syndrome (presumed): 71 patients

Allergic conjunctivitis: 6 patients

Chronic open angle glaucoma: 3 patients (1 new diagnosis)

Punctate corneal lesions: 7 patients (4 of these with dry eyes also)

Amblyopia: 3 patients

### **Analysis of clinical findings**

*Dry eyes.* The most surprising finding for me was the prevalence of dry eye symptoms. While dry eye symptoms are fairly common in low-humidity, high altitude climates, it is much less common in humid climates such as Haiti. Yet



71 of the 212 patients (33%) that were examined by ophthalmology in Timo had complaints of dry eye symptoms, a percentage far higher than that seen in general ophthalmology practices even in high prevalence regions of the United States. Dry eye symptoms was the most common presentation of any ocular disease state in this group of patients, and as a presenting chief complaint was second only to the generic complaint of “difficulty seeing.” A few of these patients were also found to have Bitot’s spots, a conjunctival area with a “foamy” appearance that is typical of vitamin A deficiency. Based on these unusual findings, and the known high incidence of anemia and vitamin A deficiency in the children, we postulated that these dry eye symptoms were an indication of xerophthalmia, or dry eyes due to vitamin A deficiency. This diagnosis was supported by a relative lack of the aqueous component of tears in the patients seen, and the absence of any significant deficiency in the lipid component of the tear film. Also, blepharitis, hordeolum, and chalazion lid conditions associated with lipid-deficiency dry eyes were not

prevalent in this population—we only found two patients with chalazion or hordeolum among all of the patients we saw.

Based on these findings, we treated patients with dry eye symptoms with a single high dose of vitamin A (which is stored in the liver and lasts for six months) and counseled them to increase their intake of foods with a high vitamin A content. We have kept a list of these patients, and have assigned a local partner to visit as many of these patients as possible to reassess their dry eye symptom level and see whether this intervention has proven successful.

*COAG.* Our other somewhat surprising finding was the relative lack of chronic open-angle glaucoma (COAG) in this population. We found only three individuals with moderate stage COAG, two of whom had already been diagnosed and were being treated by a physician in Port-au-Prince. This is very possibly an under-estimation of the incidence of COAG, since until the end-stage it is a fairly asymptomatic disease, and patients seen by

ophthalmology on this trip were self-referred for other symptoms. Also, due to time and material constraints, intra-ocular pressure (IOP) measurements were not taken on every patient, but only on those who showed optic nerve findings suggestive of COAG. Our exam efforts on this trip would therefore have missed many patients with early glaucomatous disease. The three patients seen with COAG do show that the disease exists in this population, and it is generally a heritable disease, indicating that, if feasible, future eye-care efforts should eventually include screening for elevated IOP for all patients over the age of 45. The newly diagnosed COAG patient was given a 6-month supply of glaucoma drops to use, and her IOP was checked the following day and found to have been reduced significantly to within normal range by the medication. She was educated on the need for consistent drop use and repeat evaluation to preserve her remaining vision.

*Amblyopia.* We found three cases of amblyopia in this population, two of whom were older than age 12, and therefore too old for any successful treatment. The third child with amblyopia was 8 years old, and had strabismic amblyopia, which could not be treated without surgery under general anesthesia. This was not completely unexpected, since amblyopia is slowly progressive and occurs in young patients who, even in societies where routine eye care is standard and affordable, are unlikely to mention the symptoms to their parents. This finding underscores the need for routine screening for amblyopia, as addressed below in the recommendations section.

*Cataracts.* The incidence and disability level of the cataracts seen in this population was similar to that seen in US populations, with the incidence of cataracts peaking in the seventh decade of life (with very few younger than age 50). This was also a bit surprising to me, since cataract development is known to be adversely affected by vitamin deficiency (especially vitamins A, C, and E) and poor nutrition, conditions known to be present in this area. Also, with limited access to cataract surgery, one would expect a large backlog of significant cataracts. The rate seen by us on this trip may be due to the somewhat lower rate of severe cataract formation in black versus white populations, or could simply be due to sampling bias, since we saw very few truly old patients on this trip. Although most of the middle aged patients we saw looked ten to twenty years older than their actual age (probably another nutrition-related phenomenon), I do not know whether patients in this area frequently die from natural causes prior to reaching the typical surgical cataract age-group (60–80 years old) or are just less able or motivated to travel far enough to reach our clinic.

*Corneal lesions.* One other unusual finding was that of multiple punctate sub-epithelial corneal lesions in some patients. These are of an appearance that I have never seen before in my twenty five years of ophthalmology. They were tiny yellow-white lesions on the cornea, from one to five lesions per affected eye, and were seen in the periphery or mid-periphery of the cornea. Some were grouped together and others were widely scattered, but all were tiny areas of infiltrate just under the epithelium, with a tiny central granular-appearing core of one to three small bubbles or granules. My corneal specialist partner has not heard of this type of lesion before, and due to our photographic limitations I have no good photographs of these lesions to show him. We have postulated that these could be parasitic lesions of some type (insect eggs with surrounding inflammation), injected plant material with inflammation, or possibly a variant of dry eye keratitis, since four out of the seven patients with these lesions also had dry eye symptoms. However, since there was such a high prevalence of dry eyes, the association of dry eyes with these punctate lesions may simply be serendipitous. There were three or four patients that were seen with these

corneal lesions that were not recorded on the triage records, and who are not included in these numbers. We will continue to search the literature to see if we can find any description of these corneal lesions and assess whether these indicate a significant ocular health risk.

### **Community Effect**

From a practical standpoint, the greatest impact on the daily lives of local community members from our ophthalmology efforts came from the drugstore reading glasses we distributed. Hyperopia is common in African descent populations, and while this provides excellent vision during youth and young adulthood, it leads to early and profound presbyopia as middle age approaches. For many of the middle-aged patients we examined, both distance and near vision were impaired from hyperopia and presbyopia, and these patients required two pairs of glasses, one pair for distance vision and one pair for near. Although many of these patients are illiterate, a common complaint among the middle-aged to elderly women was that they could no longer “use a needle,” meaning they were unable to see well enough to sew. Most of these patients were visibly emotionally moved when they put on the reading glasses, and from both a functional and psychological standpoint this was a significant success. I believe that the “wow factor” of this simple service adds value to the HHI efforts in the eyes of the local community, and by the last day of the ophthalmology clinic we had an increasing number of young healthy adults who came to the clinic seeking eyeglasses for fashion purposes only. They were disappointed when they were turned away with no glasses.

In preparation for this effort, we brought 105 pairs of reading glasses, about half of which were purchased with funds obtained through an Eagle Scout project, and the other half from a single donor. A few other pairs of drugstore readers were donated to the group through the Eagle project, but most of these were of cheap quality and unlikely to withstand the humid, harsh environment of Haiti, and were therefore not used. The reading glasses were purchased wholesale through our optical shop, at a cost of \$4.83 per pair. We initially felt that we might have grossly over-estimated the need for readers, but by midway through the last morning of clinic we had completely run out of readers and were taking down names and prescriptions in order to later send glasses back to these individuals. From a cost-benefit perspective, this is probably the most valuable service we provided and is one that, with the right organization, could be continued by local community residents with a minimum of cost and training, as described below.

We also had brought some used prescription glasses that had been donated for humanitarian use, and we were able to find glasses in our limited stock for 5 patients with significant astigmatism and/or myopia/presbyopia. In four other patients, we could not find glasses in our stock with a prescription close enough to work, and these patients were fitted with frames and the prescriptions recorded so that the lenses can be made at an optical shop here in Ogden, Utah, and then mailed back to those patients. Fortunately, the number of these patients was low, since making prescription glasses and sending them from the United States is much slower and more costly than drugstore reader fitting. (Even with donated labor, wholesale lens cost and donated used frames, the cost for single vision readers is around \$20 per pair and, for bifocals, around \$30 per pair. The remaining stock of used prescription glasses has been left in storage in Haiti to be used on future trips.

## IMPLEMENTATION

### Clinic Flow

For a first-time effort, the ophthalmology clinic ran fairly smoothly. The interpreter and assistant quickly mastered the basic process of vision testing, and after the first half day needed minimal direction on starting the exam process. Flow through the ophthalmology clinic was slowed at times because of time spent training the assistant and interpreter on basic ophthalmology findings, and also by the fairly unsuccessful efforts of the physician to master basic Creole phrases.

On the first day, we had some crowding issues in the waiting area for the medicine and ophthalmology clinics. As the sun rose, part of the waiting area no longer had shade from the tarps, and people moved the chairs closer and closer to the medicine clinic and into the area we were using for vision testing in order to find shade. There was also a shortage of chairs once the waiting area began to fill. Some of the waiting patients began sitting on the low cinderblock



walls that formed one side of the ophthalmology exam area, and watched over our shoulders with interest as we examined patients. This seemed to be less of an issue to the patients than the physician, but it became noisy and crowded. The next morning we rearranged the tarps to cover the entire waiting area to keep it in shade, and brought part of the tarp down to make a wall and doorway that could be closed off for privacy and darkness during the exam, which helped significantly. Members of the local villager organization, the FPF, were asked to make benches for us, which they did using plastic buckets and planks. These were unstable and there were a couple of times when an entire row of patients tumbled to the dirt, but it was still an improvement.

Another issue was with the order of patients to be seen. Once the wait for examination lengthened a bit, people began crowding the door waving their triage record in an effort to be seen, and since we were inside the eye room seeing patients, it was at times difficult to tell which patient should be seen next. Our interpreter solved this by lining the patients up on the front bench in order of arrival, which helped some. A few times younger patients became upset if we took obviously frail patients or mothers with small children ahead of them, and often did not seem to understand the need for waiting for the eyes to dilate in those patients whom we dilated. Generally our interpreter resolved these issues without much difficulty. In the future, we may need to find a better system for keeping patients in order, and create a larger waiting area with more seating; however, the flow of patients is likely to remain erratic since patients in the waiting area may be waiting for ophthalmology, medicine, dentistry and/or the pharmacy all at the same time.

### Examination



We found some significant limitations in our ability to examine patients in the course of the clinic. Some of these were due to poor preparation on my part. I forgot to bring the hand-held lenses for the indirect ophthalmoscope and slit lamp, limiting fundus exams to direct ophthalmoscopy only, which was less efficient. The retinoscope I brought had some previously undiscovered haziness to the lens and mirror, and began to fog up in the humid climate. We



we were able to clean the optics enough that, once we had a darker exam area, we were able to retinoscope patients accurately as long as they did not have significant cataract formation. I found that I had not brought enough fluorescein to check IOP's on every patient, and we checked IOP's only on those who appeared to be at risk for COAG.

The biggest limitation was simply the number of patients to be seen. On the two busiest days the ophthalmology team examined 53 patients per day, whereas a very busy day in my clinic at home with a team of trained ancillary help would be 48–50 patients. Some of the difference was made up in the longer clinic hours at Timo, but mostly by a more abbreviated examination. We quickly decided that the inherent limitations of the clinic did not allow a dilated fundus exam of every patient, and dilated only those patients who needed retinoscopy (including

children) or were suspected on the basis of the history or on direct ophthalmoscopy to have likely pathology.

### **Surgical**

Another time limitation was that imposed by our attempts at extra-ocular surgery. We scheduled five cases, one with a lid chalazion, and four with pterygium. Two of the pterygium surgery patients did not show up for surgery, and one arrived and was prepped and draped for surgery before suddenly deciding she did not want the surgery done, most likely because she was afraid. The time involved with waiting for the surgery patients to arrive and preparing the exam room for surgery without trained help is significant, as is the extra time needed for doing the surgery in the more primitive conditions in Timo. The surgeries were scheduled for the first thing in the morning on clinic days, but by the time we completed the surgeries we had a significant backlog of restless patients waiting to be seen for eye exams.

### **RECOMMENDATIONS AND SOLUTIONS**

*Preparation.* The experience of this trip should provide a solid basis for preparation for up-coming ophthalmology in Timo. I will prepare a list of needed exam and surgical equipment and supplies for future trips for the use of myself or whichever ophthalmologist goes to Timo next time.

*Facilities.* The cinder-block room we used for ophthalmology this trip was a bit primitive but certainly adequate for both exams and extra-ocular surgery. It is not, however, a viable option for cataract surgery, and even extra-ocular surgery such as pterygium excision would be much more efficient in a dedicated surgical room. The best long-term facility solution, of course, would be building our own clinic building, where we could have both

examination and surgical rooms available. The trend in the United States has long been to move toward outpatient surgical centers, and recently to dedicated in-office “clean rooms” for cataract surgery. A clinic building could easily be designed with adequate facilities for nearly all ophthalmologic surgery, which would eliminate the patient transportation and outside facility fee issues. In addition, close proximity of a clinic building to Timo would allow both surgery and patient examinations on the same day, and would greatly enhance the post-operative follow-up efforts.

In the short term, participation with one of the two local hospitals seems to be the best solution. We should be able to make mutually beneficial arrangements with the local hospitals. For instance, if HHI is able to provide an ophthalmic surgeon and an anesthesiologist for one week, and bring all the necessary supplies and medications to perform cataract or other ophthalmic surgeries, perhaps the hospital would provide access to their operating room and nursing facilities in exchange for the visiting surgeons performing some surgeries on local fee-for-service patients (with the remaining surgeries reserved for Timo residents who would only pay the initial hospital admission fee). The hospital would also make money on the guest housing for the two physicians and affiliated staff. This would require that some of the equipment (such as an operating room bed, autoclave, operating microscope, anesthesia machine, etc.) would be provided by the hospital, which would greatly reduce the amount of equipment we need to transport over to Haiti each time.

*Ophthalmic surgery.* In addition to the above problem of facilities, there is the issue of pre-operative patient selection and post-operative care with cataract surgery. Under the best of conditions, most surgeons with a single operating room to work out of can reasonably expect to do about 10 cataract surgeries per day. In Haiti, I would expect the number to be somewhat less, especially initially. The patients would need to be seen pre-operatively to be sure they are good surgical candidates, and assuming that they had been selected for surgery on a previous trip 6 months before, this could be done the morning of surgery. Post-operatively, we would like to see the patients at least on the first post-operative day to watch for endophthalmitis. This would likely mean that, under optimal conditions on a one week trip, we would likely have only four to five operating days to do surgery. In addition, if the surgeon is busily doing surgery every day, he or she would not be available to run the clinic and identify surgical candidates for future trips, meaning that two ophthalmologists would be required to adequately staff a medical/surgical ophthalmology clinic. Also, a trained surgical assistant would be needed for efficient surgical flow. Also, there is a significant amount of surgical supplies needed for each cataract surgery, in addition to the equipment needed to perform the surgery itself, all of which would need to be purchased or obtained through donation and then transported to Haiti.

*Glaucoma screening.* To be effective, screening would need to be done on all patients over the age of 45. There are simple hand-held devices that can be used to quickly check intra-ocular pressure (perhaps this screening could be done in the triage area) and those who are above threshold pressure levels would be referred to ophthalmology. It would be useful to compare the total number of patients over the age of 45 who attended the clinic this trip to the number who were seen in ophthalmology to get an idea of the total time burden of screening all the patients in this group.



*Reading glasses.* Providing reading glasses turned out to be probably the most cost-effective and significant ophthalmologic impact we were able to provide this community. Currently our cost is about \$5 per pair wholesale for reasonably good quality reading glasses, although we might be able to do even better by contacting the company directly and buying in larger bulk for humanitarian purposes. I believe, however, that we need to seriously consider how this could be done in the future. Based on the premise that simply providing free care is not enough to make the community self-sufficient, could we consider charging patients a nominal fee for the glasses, or as an alternative, providing service of some sort to the community? This could certainly be an income-based fee schedule. The same may be worth considering regarding pharmaceuticals as well. Clearly we will not be able to charge enough to make the program self-sustaining, at least not in the short term, although for many pharmaceuticals international prices in bulk are very reasonable. But requiring some charge would reduce the costs slightly and, more importantly, add perceived value to the glasses or pharmaceuticals in the eyes of the villagers. This would also reduce the “entitlement mentality” of a free handout, and reduce the number of patients seeking glasses or pharmaceuticals who do not really need them.

*Training.* Along with providing readers, it would be fairly easy to train a local individual to briefly evaluate patients and help them choose appropriate readers, as well as keep a list of patients who may need to see the



ophthalmologist on the next scheduled clinic. With the right education, these trained people would be able to screen for simple eye diseases, manage the reader supply, and collect money paid for readers.

*Amblyopia screening.* This is one area where education of the villagers (or at least of key village participants) can have a major impact. Identifying children at risk for amblyopia prior to age 6 is critical in treating this potentially curable ocular disease. It is my understanding that when our school visit teams went to the local schools, they did not find the same receptiveness they experienced on previous trips, and therefore they were unable to initiate any school vision screening programs, despite being equipped to do so. While other organizations, including the FPF, could be enabled and equipped to do this sort of screening, it is by far most effective and comprehensive if it is done in the schools, since that is the only controlled, consistent environment in which rural children tend to congregate. Hopefully, future efforts to educate teachers and school administrators of the value of these programs for their children will lead to the effective institution of this screening effort.

## PERSONAL REFLECTIONS

Although I have been involved with several previous third-world ophthalmology trips, each location is unique in many ways. This trip to Timo was no exception. This was the first humanitarian medical trip I have taken where the team included other medical specialties. It was exciting and inspiring to work alongside family practice doctors and dentists, and to see how hard they worked and the types of severe conditions they were dealing with. Their presence

also provided the much needed backup I have lacked on other trips, where one sees so many patients with debilitating disease outside one's own specialty but has no one to refer to. The stability and experience of the team from previous visits to this area greatly added to the efficiency of the entire system, and provided a solid framework for my own work, eliminating many administrative tasks that would otherwise have consumed precious clinic time. The prior positive experiences of the entire community with HHI was a definite draw to patients and allowed me to see many more patients in a single day than on previous trips elsewhere. The strong desire for service and the positive atmosphere of teamwork and camaraderie exhibited by the entire team was refreshing, and eliminated the typical "third world medical clinic anxiety," which makes me feel as though the success of an entire trip was dependent upon me as the providing physician.

Perhaps the most exciting aspect of this trip for me was the excellent foundation HHI has made in involving the local community members with decision making and support for the medical teams. I believe that the active participation of the FPF in the entire process, limited though it may be, is critical to the long-term success of this medical initiative, and is the key component that is so often lacking in other third world medical programs. When a local community is empowered and educated, they can make tremendous progress in resolving the underlying causes of local health problems, far exceeding the limited impact we can make in a single week of medical treatment. I especially appreciated the multi-disciplinary approach of involving experts in data entry, nutrition, agronomy, water systems, preventative medicine, and health education in addition to the often more dramatic but ultimately less effective physician services.

Each trip like this provides ample opportunity for reflection on our own state of relative prosperity and our inner desire to reach out to help others with greater physical needs. I have often wondered what it is that drives us to leave the air-conditioned, indoor-plumbed, cellophane-wrapped comfort of our homes to attempt the often frustrating delivery of modern medical care in primitive conditions. Always, I find that it is the human connection that draws us back. One cannot help, in the midst of such poverty, to recognize and marvel at the happiness and humanity one witnesses in the faces of those who sit patiently on rough plank benches, waiting their turn in the clinic. Gone is much of the sense of importance, entitlement, and hurry so common in both patients and providers in our own clinics back home. Here, the practice of medicine is reduced to its simplest and purest form: one human being reaching out to relieve pain, suffering, or disability in another human being, and being uplifted, refreshed and inspired in turn. Who is to say which of the two receives the most from such an exchange? But I suspect that as long as I continue to feel the same gentle, uplifting stirrings of the soul provided by these experiences, I will continue to return.

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