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RHODE ISLAND
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Brown In the Lesser Developed World

What's in a Name???

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NEIGHBOR - friend, near

ALLIANCE - affiliation, association, marriage, relationship

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COMMENTARIES

CONTRIBUTIONS

Brown In the Less Developed World
Guest Editors: **Susan Cu-Uvin, MD, and David Pugatch, MD**

COLUMNS

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Commentaries

Personal Reflections On This Issue

I generally do not tailor my monthly column to the topic of the journal. Since the topics that I choose to write about enter my consciousness in a random, uncontrolled manner, I find myself unable to choose a topic, like the topic the particular issue is devoted to. This issue was no exception until I read the student's article that began with a case of tetanus.

Tetanus is engraved in my memory as well.

I first went to Africa in 1969. I spent two years as a Peace Corps volunteer, teaching high school math and math pedagogy at a teacher-training college in the northern region of Ghana, a place considered "bush" by the people who lived in the more developed, and richer, southern regions. It was this experience that triggered my interest in medicine.

I returned to Africa in 1978 to complete my last three months of medical school. I worked/studied in the bush of Tanzania, at the hospital of the Medical Missionaries of Mary, a wonderful group of Irish nuns. As my teaching assignment in Ghana was at the Men's Evangelical Presbyterian Teacher Training, it was ironic that I, a Jewish boy from the Bronx, would now work at a hospital run by nuns, after teaching at a school run by evangelical Presbyterians.

I first heard about the hospital from the chief resident in internal medicine at Harlem Hospital when I was a student. It sounded perfect for me and I arranged a position, with my medical school's cooperation, for a fourth year elective. The school had a scholarship for tropical medicine, which I applied for and got, but it wasn't very much money. I appealed to the head of the tropical medicine department for more financial help. The trip alone was a budget buster.

"Are you in profound debt?" he asked.

I was surprised. This was a personal question, phrased in a very odd, rather literary manner.

"As a matter of fact, I am."

"Then a little more won't matter very much, will it?"

Twenty seven years later I still can't decide if this was a sage question or not. I got two tropical medicine scholarships as the previous year's one hadn't been used, and I increased my debt. It was worth every penny of the principal and the interest, profound or not.

I helped in the OR, and I "ran" a TB ward for adults and one internal medicine ward, under the supervision of a British doctor. Since I was in the last three months of medical school they gave me a fair amount of responsibility after I acclimatized and they got the measure of my capabilities.

I also took call, which meant getting roused when someone came in after the clinics closed. I remember vividly the night I was on call and saw a young woman who couldn't open her mouth. In an experience that was almost hallucinatory, I heard one of my medical school neurology attendings, a Ghanaian working in the US, say, "whenever you see someone who can't open their mouth, think of lockjaw and look for a sore." I looked for the sore, and found it on the leg. I then noticed not only the lockjaw, but the opisthotonus as well. She died, of course.

Back in the days before AIDS, we washed our hands before spinal taps but didn't use gloves. We reused needles after cleaning and autoclaving, and reused surgical gloves after washing and sterilizing as well. We had a truck headlight attached to a battery for a surgical light. Patients were carried by stretcher from untold miles away, down the cliff at the edge of the Rift Valley. Patients brought their own food and families did a lot of the nursing care.

I was mildly scolded for donating my own blood to a patient slowly exanguinating from TB. It was "wasted," they correctly observed. I helped a teenage girl with rabies die without pain. I watched a dead baby, stuck part way out of the vagina in a birth that began far away and failed to complete, get dismembered with a shears so that it could be withdrawn from the birth canal.

Yet I still became a neurologist, a fairly useless occupation for these people. I had always intended to go back to someplace in Africa, and I finally got a chance a few years ago to do the only thing a neurologist can be productive doing there, which was teaching. I was a visiting professor, seeing patients, teaching housestaff and a few students the basics of neurology. It was rewarding for me, although less so for the patients who were rarely diagnosed, and even less commonly treated for anything. Nevertheless, neurology is an important discipline for doctors in the third world to know. Epilepsy, in particular is a very serious problem which leads to a large number of injuries, with people falling into open cooking fires, or out of canoes. Mental illness is virtually untreated. In Zambia there was a single psychiatrist in the country, and he was an elderly expatriot who had been trying to retire for several years. In a town near a major tourist attraction there is a one room hut, with a lock, for any insane villagers to be kept until they can be sent to the single psychiatric hospital in the country.

I plan to spend a month teaching in Kenya in one of the Brown programs in early 2008. I've reserved the month and will go with my medical student daughter. I wish I could stay longer. I plan, when I have no children in college, to create a job where I spend part time in Rhode Island and part time somewhere in Africa. I don't know where. To be honest, I can probably do more "good" by making as much money here as I can and donating it to Doctors Without Borders, or to Paul Farmer, but there is a role, too, for those of us who like to move into other cultures, expand our own frontiers, and hopefully help some people as we do it.

The Brown programs described in this issue excited me. I am happy that we have people doing things like this in our community. I am particularly happy that their spirit has been taken up by their students. The apple doesn't fall far from the tree, I am happy to observe. Good doctors make good doctors.

– Joseph H. Friedman, MD

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The Serendipitous Gift of Epiphany

The Greeks defined epiphany as the sudden emergence of something important, the transformation of something banal into a special, perhaps memorable, event, or the unforeseen appearance of something glorious, perhaps even divine. Since then, as with so many words of Classical origin, epiphany has taken on a number of divergent meanings.

To theologians, epiphany has come to mean a manifestation of a divinity, a spiritual revelation. The Christian festival of the Twelfth Night [January 6], called the Epiphany, celebrates the disclosure of Christ's divinity before the Magi.

Epiphany is a resplendent noun, resonant with meaning, glorifying anything that the writer feels is deserving of extreme reverence. And to scientists it has come to mean that rare but exultant moment during the course of lengthy experimentation when an underlying physical principle or fundamental explanation suddenly leaps into consciousness.

Both epiphanies and serendipities share the joys of sudden revelation; but to the scientist, there are differences. Serendipity is the revelation which materializes while the scientist is pursuing another experiment. It represents an uncomfortable aberration in the generated data which is contrary to expectations. This will be treated by some as an intrusive annoyance; but to others, the more creative ones, it will represent a startling answer to a question which had not even been asked. An industrial scientist, for example, starts out to seek a more efficient lubricant but ends up with a strange substance in his test tube, a substance which, with further exploration, turns out to possess wondrously adherent qualities, a superglue. This is serendipity and it marks the careers of those with sufficient courage to seek out anomalies..

Serendipity is sometimes reached through mishap rather than meticulous planning. Consider, for example, the professional career of William Henry Perkin [1838 – 1907], born in East London, the gifted son of a journeyman carpenter. Young Perkin attended the Royal College of Chemistry and was assigned the task of synthesizing quinine, then an exorbitantly expensive medication needed by Britain as it embarked upon its imperialist expansion in Africa and Asia.

Perkin was unsuccessful in synthesizing quinine but in his studies of coal tar derivatives, he isolated a brilliant purple dye which he called Mauveine. When applied to raw silk, it was color-fast. Perkin patented his discovery [at age 18] and went on to become Britain's leading industrial chemist, discovering countless dyes which allowed England to compete effectively with Germany in the lucrative textiles industry. One of the many coloring substances isolated by Perkin was a curious chemical called phenolphthalein. No textile use was found for it and so it languished for years until the first decade of the 20th Century when the Hungarian vineyards were attacked by a pestilence which almost destroyed Hungary's wine industry. Until new vineyards could be established, the local wineries resorted to making artificial wines, a combination of water, grain alcohol and fruit juices. The artificial wines, however, needed a vivid coloring agent; and after many trials phenolphthalein was chosen since it imparted a wine-like color to the adulterated product. Shortly after distribution of the synthetic wine, an epidemic of unexplained diarrhea erupted amongst consumers. It did not take long for the vintners to appreciate that the phenolphthalein was responsible. Within another decade this agent, first isolated by Perkin as a textile dye, became the world's most popular laxative in such proprietary pharmaceuticals as Feen-A-Mint and Ex-Lax.

To the scientist, an epiphany is a unique spiritual happening when some unevoked reasoning transiently illuminates a previously enigmatic path, when the tension between the intuitive and the rational is not ignored. It represents the highest emotional peak achieved by a scientist; and it arises when, during the course of extended experiments, the underlying physicochemical principle governing the experiments suddenly becomes apparent, when the dots become connected. To a serendipitous event, the scientist will exclaim: "Wow," or "Holy mackerel!!" or "Gee, how do I account for this ?" But to a scientific epiphany, on the other hand, she might utter: "Aha!" or "Eureka!"

Apples have been falling for millennia without exciting people to dwell upon the dynamic reasons underlying their descent. Then, an Englishman named Newton, perceived that something was operative, something more than the banal reality that objects in space, when untethered, tend to fall rather than rise. But further, he saw the commonality between the descent of the apple and that invisible force called gravity holding planets in their celestial orbits; and further, the epiphany that this force called gravity abided by precise mathematical rules.

Scientists have traditionally distinguished between discovery, invention and creativity. Root-Bernstein, the physiologist, once declared: "We invent by intention; we discover by surprise." Yet others interested in the philosophic underpinnings of science propose a hierarchy of challenges in the basic sciences: There is first, discovery, which they define as disclosing something which always existed but had never previously come to the attention of the community of scientists. [Thus, America was discovered; although America had always existed.] And then there is invention defined as the conscious assemblage of technical products yielding a completely new gadget. [The inventive mind of Edison led to such innovative products as the electric light bulb and the phonograph.] An finally, there is the creative mind, the mind capable of envisioning bold but inapparent connections and theories which bring together and serve to explain ostensibly unrelated natural phenomena.

What are the practical differences between serendipity and epiphany ? Seeking stray coins in the street and finding, instead, a lottery ticket is serendipity. If the lottery ticket is a winning one, that is epiphany.

– Stanley M. Aronson, MD

Disclosure of Financial Interests

Stanley M. Aronson, MD, has no financial interests to disclose.

A Message From the Dean

Eli Y. Adashi, MD

Developing countries throughout the world are afflicted with a multitude of parasitic and infectious diseases for which the diagnosis, treatment and prevention are still very much wanting. For the past twenty years, Brown University's faculty, fellows, residents, medical and undergraduate students have participated in a variety of efforts throughout the globe to treat patients, train overseas physicians and medical professionals, and develop delivery protocols addressing social and cultural barriers to treatment and prevention.

Much of Brown's participation in the global health front began as a volunteer effort supported by private contributions of resources and time by our faculty and students. These efforts have grown into established collaborations and programs with clinics and hospitals, educational institutions, and governments in various corners of the developing world. Today, Brown University boasts 55 faculty members who are actively engaged in global health efforts, a contingent representing 13 academic departments and over $12 million in peer-reviewed funding. Overall, we are stretched across 5 continents and 28 countries.

There is much work left to be done. In the coming year, and with Brown University President Ruth Simmons' focus on the internationalization of the University, we will expand and coordinate our global health efforts by identifying opportunities for interdisciplinary research and collaboration so as to leverage our collective resources to promote well-being for all.

Eli Y. Adashi, MD, is Dean of Medicine & Biological Science, the Warren Alpert Medical School of Brown University.

Disclosure of Financial Interests

Eli Y. Adashi, MD, has no financial interests to disclose.

Brown's Involvement In the Health of Less Developed Countries

Susan Cu-Uvin,MD, and David Pugatch,MD

This issue of *Medicine& Health/ Rhode Island* is devoted to the involvement of the Warren Alpert Medical School community in global health. Represented in this issue are a sampling of the projects and collaborations, representing the remarkable efforts and commitment of faculty and trainees of all levels. These reports from the field demonstrate the ways in which global health activities have been integrated into our mission as researchers, medical educators and clinicians.

Why the proliferation of global health projects? Perhaps physicians and researchers have come to recognize what economists have known for decades: that our world has become increasingly interdependent. Communicable diseases, such as HIV, multidrug resistant tuberculosis, SARS and pandemic influenza, are an airplane ride away. As the populations of the world migrate across national borders, diseases are carried to new locations. Thus, it is hardly surprising that, each day, Rhode Island physicians see diseases of the less developed world at the clinic or hospital. Conversely, as a result of globalization and lifestyle modernization, the common chronic diseases of the western sedentary world such as type II diabetes and coronary vascular disease, are making their way into the populations of less developed countries.[1]

An over-arching theme runs through these articles: faculty and students at Brown perceive a responsibility to help the less fortunate peoples of the world. This comes, at least in part, from an awareness that the health disparities between developed and less developed countries are significant and unacceptable. For example, 89% of the world's population lives in countries that bear 93% of the world's disease burden. However, they account for only 11% of the world's health spending. The chance of dying from pregnancy-related causes for a woman in a less developed country is 38 times that for a woman in a developed one. Additionally, less developed countries bear 99% of the burden of global maternal deaths.[2]

These articles highlight the different roles of faculty and students:

+ Programs at the Warren Alpert Medical School of Brown University are helping countries to build capacity and infrastructure to address epidemic infectious diseases. Dr. Kenneth Mayer and Eileen Caffrey summarize the 12-year experience of Brown's AIDS International Research and Training Program, sponsored by Fogarty International Center of the National Institutes of Health. This program, involving both hospital-based and campus-based Brown faculty, has trained more than 50 scholars in HIV/AIDS research from five Asian countries. After periods of training at Brown and the Miriam Hospital , trainees from Philippines, Cambodia, India , Indonesia, Kenya, and Bangladesh return to their home countries to build local capacities.

+ Drs. Jennifer Friedman, Jake Kurtis and Stephen McGarvey have worked with investigators at the Research Institute of Tropical Medicine in Manila, to elucidate the pathogenesis, disease burden, and ecological factors in transmission, of a common yet poorly understood parasitic infection- Schistosomiasis. Their work, funded by the **National Institutes of Health** (**NIH**), has shed light on the role of pro-inflam-

matory cytokines in mediating the disease outcomes seen due to infection by *S. Japonicum,* and the role of other mammals in maintaining transmission.

+ Professor Stephen McGarvey discusses the twin epidemics of obesity and type II diabetes mellitus among of the populations of the Samoan Islands. His work over the past three decades details the health transition typical of many modernizing populations from a predominance of morbidity from infectious diseases to an emerging importance of chronic non-communicable diseases that typify populations of the western world.

+ Medical students Natasha Rybak, John Ly and medicine resident David Sears highlight the educational value of experiences in international medicine. Each reported back from lesser developed countries (Burundi, the Dominican Republic and Cambodia). They considered the rotations "life-changing." The opportunity to work within a less developed country's healthcare system provides trainees with a broadened view of medicine's cultural context.

Additionally, medical trainees who undertake global health electives in less developed countries benefit from medical learning opportunities which could only be had outside of the United States. Students and residents encounter diseases commonly seen in the United States, such as pneumonia or cancer, but at a very late stage of presentation. They learn about tropical diseases, such as malaria, schistosomiasis and dengue fever, that are occasionally seen in Rhode Island. They re-discover the value of the stethoscope, learning that medicine can be practiced rationally, judiciously and effectively in places without MRI and CT scanners.

+ Dr. Edward Wing, Chair, Department of Medicine , describes the research and exchange collaboration in Eldoret, Kenya, and lists the rich international health opportunities available through the department of Medicine. He reminds us through his personal experience and commitment, that international medicine experiences are "life-altering" adventures which fundamentally change, for the better, our perception of medicine and the world. We return from resource-poor to us in the United States.

+ Simon Desjardins and colleagues, in their article on caring for HIV-Infected Refugees in Rhode Island, remind us that global health maladies exist here and now, in our own local practices. The provision of healthcare to the refugees and immigrants of Africa, Asia and Latin America challenges the clinical skills and cultural competence of the medical provider.

A passionate sense of moral obligation and humanitarian purpose permeates these articles. This obligation is perhaps summarized best by economist Jeffrey Sachs' observation: "… certain parts of the world are caught in a downward spiral of impoverishment, hunger and disease. It is no good to lecture the dying that they should have done better with their lot in life. Rather it is our task to help them onto the ladder of development…from which they can then proceed to climb on their own."[3]

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Brown's Fogarty International Center AIDS International Research and Training Program:
Building Capacity and New Collaborations

Kenneth H. Mayer, MD, and Eileen Caffrey

Brown University faculty have been involved in infectious disease research in Asia, particularly in the Indian subcontinent, for more than 40 years. In the 1960s, Dr. Charles Carpenter conducted pivotal studies to delineate the pathogenesis of acute diarrheal diseases in Calcutta, contributing to the development of oral rehydration therapy. Because of the increasing demands of the global AIDS epidemic and the recognition of the potential for a rapid escalation of the epidemic in Asia, Dr. Carpenter led the Brown team to successfully apply for a Fogarty AIDS International Training and Research Program grant (D43TW000237) 14 years ago. The initial Brown AITRP focused on Brown's training of clinical researchers in the Philippines and Indonesia. The program has evolved, and been consistently funded, with successful recompetitions in 2000 and 2005, led by Dr. Kenneth Mayer, who became the Principal Investigator for the AITRP in 1997. A strong collegial Executive Committee has included hospital-based clinical researchers: Drs. Carpenter, Timothy Flanigan, Susan Cu-Uvin, David Pugatch and Herb Harwell, as well as faculty from Brown's International Health Institute, Drs. Stephen McGarvey and Mark Lurie.

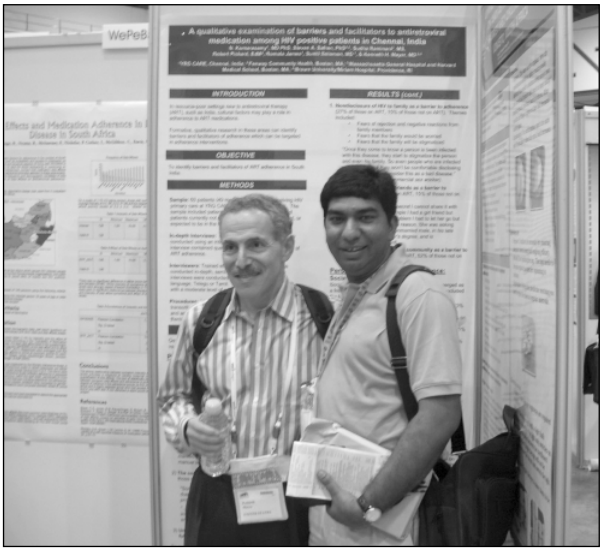
As increasing collaborations developed in several other countries, the Fogarty AITRP expanded to train clinical, laboratory and behavioral researchers from India and Cambodia. In 2000, because of growing clinical research contacts, including collaboration in an integrated NIH Center for AIDS Research (CFAR), the faculty of Tufts University/ New England Medical Center, led by Drs. Sherwood Gorbach and Christine Wanke, were asked to participate in the Brown AITRP. This collaboration resulted in enhanced training opportunities, particularly in the HIV and nutritional research. Additional trainees from Vietnam and Western Kenya were supported in 2006.

Over the past 14 years, the Brown-Tufts AITRP has trained more than 50 Asian scholars, resulting in almost 100 peer-reviewed publications and almost 200 presentations at recent international conferences. Early trainees generated one of the first reports that defined the prevalence of a multiclade HIV epidemic in the Philippines.[1] Other studies described the prevalence of HIV and STDs in pregnant women in the Philippines[2] and India,[3] high risk heterosexuals in India,[4] and HIV prevalence in rural areas in India using dried blood spot technology.[5,6] The increased clinical research capacity developed at several of our affiliated international sites led to the first reports of the clinical impact of generic **highly active antiretroviral therapy** (**HAART**) in India,[7] resulting in decreased morbidity and mortality, while alerting clinicians to drug-associated side effects.[8,9] In another pivotal study, Brown AITRP Indian trainees demonstrated the presence of antiretroviral resistance mutations in treatment-experienced and naïve patients.[10] Brown-Tufts Fogarty trainees described the etiology of HIV-associated wasting and diarrhea, as well as conducted initial studies of the nutritional and metabolic effects of generic HAART in India.[11,12] Trainees have also been among the first to describe the use of low-cost clinical monitoring technologies to track the course of HIV infection and response to therapy.[6,13-15] AIRTP trainees from this program conducted some of the first first clinical studies describing the natural history of HIV disease in Cambodia.[16-18] Papers by Brown-Tufts AIRTP trainees have appeared in the *Lancet,* [19, 20] *Clinical Infectious Diseases* [7] *Nature Immunology*,[21] and AIDS-specific journals.[22-25]

The trainees have risen to prominence in the AIDS research and public health infrastructures of their home countries: the YRGCARE Research Laboratory in Chennai, India, which is led by former trainees, has been designated as a WHO antiretroviral resistance reference surveillance lab. One Brown AITRP trainee has been appointed as an Assistant Minister for Health in Cambodia; several trainees are members on national AIDS advisory committees. Trainees have also been appointed as advisors to UNAIDS, IAVI, and the Gates and Clinton Foundations, and have been involved in writing the WHO guidelines for the use of antiretroviral compounds in resource-constrained environments. A description of major national efforts is summarized below.

India

YRGCARE has become a model center for the provision of community-based HIV care, with close to 10,000 individuals diagnosed with HIV since the inception of the organization more than a decade ago, and more than 3,000 individuals now receiving antiretroviral



Drs. Kenneth Mayer and N. Kumarasamy

therapy. YRGCARE has become an NIH-funded AIDS Clinical Trials Unit and HIV Prevention Trials Unit; its founder, Dr. Suniti Solomon, a Brown collaborator, has received NIH-funding to study HIV-related stigma. YRGCare's lab director, Dr. Balakrishnan, has been funded by the NIH to study the genital tract responses of HIV-exposed, but uninfected women in serodiscordant relationships. The collaboration has resulted in more than 2 dozen joint publications, and more than 40 presentations at international AIDS conferences. YRGCARE has a free-standing **institutional review board (IRB)** and an active **community advisory board (CAB),** and has been integrated into the HIV Prevention Trials Network, conducting studies of HIV seroprevalence and incidence (HPTN 033) in high-risk populations with Dr. Suniti Solomon as the site PI.[22-25] An AITRP funded sub-study that evaluated the prevalence of sexually transmitted infections in Chennai found that more than 30% of the men and women recruited in the study were infected with *Herpes simplex* Type 2.[26] Among the women, almost 10% had trichomoniasis, and syphilis was almost equally prevalent. An R21 funded by NIH/NIMH (Dr. T. Flanigan, PI) was awarded to Brown and YRGCare to investigate the neurocognitive consequences of HIV/AIDS in South India. Suneeta Saghyam, MSc, a nutritionist at YRG, has initiated a project that is examining the impact of the initiation of generic NNRTI based HAART on the nutritional and metabolic status of HIV-infected adults at YRG CARE. She has presented preliminary data at the Bangkok International AIDS Conference Meeting[12] and the International Lipodsytrophy Meetings in 2004 and 2006.

Although antiretrovirals are available at relatively low cost in India, their use is not universally common. The most common presentations of HIV/AIDS in India include wasting, respiratory and diarrheal diseases. With the support of Fogarty AITRP, Dr. Gangadeep Kang of Christian Medical College in Vellore has trained investigators to evaluate intestinal function and diarrheal pathogens in HIV-infected patients. Dr. Kang is the PI for an AITRP-funded protocol to investigate the molecular epidemiology of cryptosporidial infection in HIV. She presented preliminary results from this work at the 2004 meeting of the American Society of Tropical Medicine and Hygiene.[27] Christian Medical College in Vellore has been named a government of India ART roll-out site, and AITRP trainees and collaborators have received a Planning Grant for **Global Research in Infectious Disease Research (GRID)** in South India, and an R03 to study the Molecular Epidemiology of Cryptosporidiosis in South India for their work on the diarrheal diseases in the setting of HIV. Another AITRP trainee from CMC Vellore, Jessie Lionel, an obstetrician-gynecologist, is assessing the prevalence of HIV infection among pregnant women in local urban and rural areas.

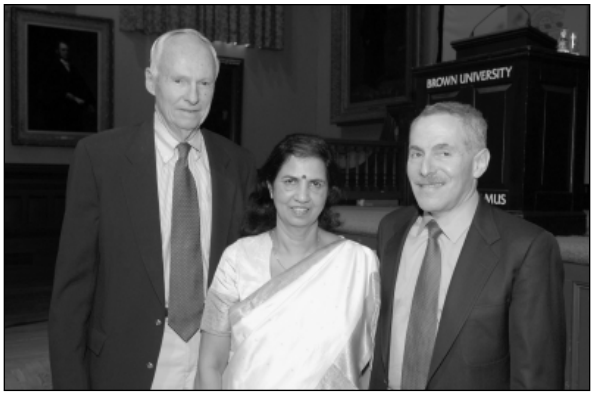
The Brown-Tufts AIRTP has also developed a robust training collaboration with the Indian Council for Medical Research-affiliated **TB Research Center (TRC)** under the leadership of Dr. Soumya Swaminathan. One of her colleagues, Geetha Ramchandran, PhD, learned new pharmacologic evaluation techniques to be able to do assays of generic antiretroviral therapy to establish bioequivalency.[28] From this training, she has established facilities at the TRC to examine the interaction of antituberculous and antiretroviral medications in common usage in South India.

Another major focus of our training program for Indian colleagues has been microbicide research. In 2002, the Brown-Tufts AIRTP hosted two clinical investigators, Drs. Kamini Walia and Nomita Chandhiok from the **Indian Council for Medical Research (ICMR)** in New Delhi, to learn immunological techniques to be able to assay genital cytokines as surrogate markers to evaluate mucosal toxicity in clinical microbicide studies, as well as to learn principles of clinical microbicide trial design. Most recently, Brown-Tufts AIRTP developed relationships with several teaching hospitals in Mumbai. Sameer Kumta, a physician trained in Infectious Diseases and Public Health posted at the **Mumbai District AIDS Control Society (MDACS)**, completed the MPH program at Brown University this past year. His thesis examined the secular trends in HIV and STD incidence among MSM in Mumbai over the past decade; the data were presented at the 2006 International AIDS Conference.

The Brown-Tufts AITRP program helped to inaugurate the Fogarty-Ellison Medical Student Fellowship program in 2004, which has evolved into the **Fogarty International Center Clinical Scholars Program (FICSP).** Through this program, 8 American and 8 Indian medical and public health students have been trained, spending a year overseas conducting clinical research. They were mentored at Brown-Tufts AITRP-affiliated sites at YRGCARE in Chennai and at Christian Medical College in Vellore, India. Trainees have worked on a range of projects, including primary data analyses, field and laboratory work, and have assisted in the evaluation of natural history data.

Philippines

Brown faculty have been working with clinical investigators from the University of the Philippines for over two decades. In 1992, a World AIDS Foundation grant allowed the first HIV/AIDS trainees to come to Brown. The primary area of emphasis was HIV prevention. Since then, more than 20 trainees have come to Brown for HIV/AIDS training under the Fogarty grant. The trainees have included physicians, and other clinicians, social and behavioral scientists, administrators, as well as basic scientists. Studies by Brown-Tufts Fogarty trainees in the Philippines have focused on the determination of the prevalence of HIV infection among 3,000 pregnant women at the Philippine General Hospital,[2] the assessment of knowledge, attitudes, beliefs, and behavior among health care workers involved in the care of HIV/AIDS patients.[29] the prevalence of high-risk behaviors and sexually transmitted diseases among women prisoners at the state penitentiary in Metro Manila,[30] the expression of Human immunodeficiency virus in the plasma and cervicovaginal secretions in Filipino women,[31] the prevalence of HIV among patients hospitalized for acute Pelvic Inflammatory Disease,[32] and the prevalence of lower genital tract infections among HIV-infected and high risk uninfected incarcerated women.[33] Other studies have evaluated the effectiveness of peer counseling by video versus face-to-face on the knowledge, attitudes, and practices of Filipino



Drs. Kenneth Mayer, Suniti Solomon, and Charles Carpenter

commercial sex workers,[34] the presence of antiretroviral drug resistance among recently diagnosed treatment-naïve HIV-infected individuals in the Philippines,[35] and the transmission of HIV-related tuberculosis.[36] The Brown-Tufts AIRTP has trained health care professionals in HIV/AIDS-related research from 4 teaching hospitals in Manila as well as from the Department of Health. Many of the trainees are also involved with several non-governmental organizations. The AIRTP grant has also been instrumental is training Dr. Agdamag, the lead virologist at the San Lazaro **STD/AIDS Cooperative Central Laboratory** (**SACCL**) in plasma HIV RNA quantification, antiretroviral resistance testing and clade analysis.

Cambodia

Fogarty trainees in Cambodia, in conjunction with collaborators at Brown and the Cambodian Ministry of Health, received funding from the World AIDS Fund to train physicians in the care of HIV-infected women and to create a referral clinic for HIV-infected women in Phnom Penh. Several of the Brown Fogarty-affiliated sites helped to found the amFAR TREATAsia observational database, the first multinational profile of the changing HIV/AIDS epidemic in Asia, which has subsequently received NIH support. The first case of HIV infection in Cambodia was detected in 1991. The Cambodian Ministry of Health undertook annual sero-surveillance and behavioral surveillance among risk groups around 1995. Since then, the prevalence of HIV infection in the general population peaked in 1997, at around 4%. With an aggressive strategy of prevention interventions, coupled with a lack of treatment resources and a high mortality rate, the prevalence of HIV infection in Cambodia has gradually declined to its current level of 2.6%.

Because of a rising HIV prevalence in women in Cambodia, our trainees' initial efforts focused on seroprevalence of HIV among pregnant women in Sihanoukville.[17] This study established a seroprevalence rate of 4.2% among 600 consecutive parturient women who delivered their babies at Sihanoukville General Hospital, justifying expansion of pMTCT intervention programs to provincial areas. A second Brown trainee, Dr. Seng Sutwantha, from the **National Center for HIV, AIDS, Dermatology and STD** (**NCHADS**), evaluated key outcomes in the first MTCT pilot prevention project in Cambodia, implemented at hospitals in Phnom Penh and Battambang. Additional training and studies have examined the etiology of chronic diarrhea in HIV-infected in-patients, the spectrum of opportunistic infections,[18] and the etiology of meningitis[16] among hospitalized AIDS patients in Phnom Penh at the Preah Bat Norodon Sihanouk Hospital. Collaborations now include the National Pediatric Hospital in Phnom Penh, where studies are examining a diagnostic algorithm for HIV-exposed newborns enrolled in a pilot mother-to-child prevention project. Another trainee at the National Pediatric Hospital, Dr. Sam Sophan, is conducting a study of directly observed antiretroviral therapy for children. Pediatric collaborative relationships have developed as well with the Angkor Hospital for Children in Siem Reap, where a study of nutritional assessments in HIV-infected children is being developed by trainee Soeung Seithaboth. Another collaborative site, the Sihanouk Hospital Center of HOPE, has completed a cross-sectional study of stage of disease among newly diagnosed patients.

With the help of the Lifespan/Tufts/Brown CFAR and the World AIDS Foundation, Drs Cu-Uvin and Harwell established a women's HIV Clinic in Center of HOPE, in Phnom Penh, and a **Fogarty International Research Collaboration Award** (**FIRCA**) has been funded for this women's clinic to study the determinants of genital tract subtype AE HIV-1 shedding among women initiating generic antiretroviral therapy. Dr. Kruy Lim, a recent AITRP trainee, has developed a research proposal to further describe the spectrum of cervical dysplasia among women followed through these programs. AITRP trainee, Dr. Thai Sopheak has developed a project to evaluate smear negative TB/HIV co-infected patients. One Center of HOPE trainee, Sok Phan, completed the Masters of Public Health program at Brown and a physician from the Ministry of Health, Kim Bunna, is currently enrolled in the Brown MPH program.

Indonesia

The Brown-Tufts AIRTP began its collaborations in Indonesia in Yogykarta, at Gadja Madah University, under the aegis of Dr. Tony Sadjimin, the Director of the Clinical Epidemiology and Biostatistics Unit, resulting in the training of 6 clinical investigators from Javanese Universities. One of the collaborative projects was a sero-surviellance study of HIV and syphilis among commercial sex workers in Central Java.[37] In the past few years, training efforts have increased in Bali, because of the rapid spread of the AIDS epidemic there. Brown worked with two professors from Udayana University in Bali, Dr. Tuti Parwarti and Dr. Dewa Nyoman Wirawan, and two of their junior faculty, Dr. Asep Purnama and Dr. I. Gusti Sumantera, have received training fellowships at Brown. Dr. Sumantera developed a Fogarty AIRTP-funded project to evaluate the role of medical incentives, such as free sexually transmitted diseases and hepatitis screening for injecting drug users, in order to increase patients' willingness to be tested for HIV. The project enrolled more than 200 participants; and the preliminary results, presented at international conferences, are now in press.[38] Political unrest in Indonesia has slowed recruitment and training activities, but new Indonesian trainees are anticipated in the near future.

KENYA

Because of the extensive collaborations developed by Dr. E. Jane Carter, the Director of Brown University's TB program, and the academic alliance, AMPATH, based at Moi University in Eldoret, in Western Kenya, the Brown Fogarty AITRP recently expanded its training activities there. The first two Kenyan trainees, an obstetrician-gynecologist, Dr. Hillary Mabeya, and a pediatrician, Dr. Esther Nabakwe, completed several months of clinical research training at Brown. They have returned to develop new projects, and expand the already considerable Brown-Moi collaborations, which already have included student exchanges, and visitors by senior faculty, such as Drs. Edward Wing and Timothy Flanigan, in conjunction with Dr. Carter. The Kenyan trainees will help to develop the research infrastructure needed for this tertiary center, which is in the center of an area of high HIV prevalence.

CONCLUSIONS

Brown's involvement in the Fogarty AITRP has helped to train clinical investigators and leaders in the fight against AIDS in several Asian countries. At the same time, Brown students, residents, fellows and faculty have benefited from their immersion in dealing with the emerging AIDS pandemic and associated communicable diseases. These collaborations have resulted in professional growth locally and overseas, but also have reminded the involved Brown community members of the shrinking planet we share with people living in dire circumstances a few plane rides away.

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The Dual Burden of Infectious and Non-Communicable Diseases in the Asia-Pacific Region: Examples from The Philippines and the Samoan Islands

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Reduction of childhood mortality from infectious diseases in developing nations has led to an increase in the proportion of adults in those populations and the consequent rise in **non-communicable diseases (NCD).** [1] This health transition is happening globally at different rates, but one concern for medicine and public health is the dual burden of disease stemming from the still important infectious diseases coexisting in nations, communities and families with the increase in NCD. [2] This dual burden is present throughout the world.

We feature here two examples in the Asia-Pacific region: schistosomiasis in The Philippines and cardiovascular diseases in the Samoan Islands. Brown University faculty members pursue active work in global health in these places; this report provides a summary of our current and recent research and future directions.

Schistosomiasis in The Philippines

Together with the Research Institute of Tropical Medicine in Manila, a unit of the Philippine government Department of Health, investigators based at the Brown University International Health Institute and Lifespan's Center for International Health Research have been investigating schistosomiasis for over two decades. In fact several Brown University faculty featured their research in a 1992 issue of this journal dedicated to schistosomiasis. [3] In this article, we will first provide an overview of schistosomiasis, then focus on studies conducted in the past decade, and finally discuss future goals and directions.

Schistosomiasis infection affects approximately 207 million people in tropical countries, 20 million of whom have severe illness. [4-6] Individuals are infected when they wade into fresh water and cercaraie penetrate the skin to begin the human portion of the life cycle. Three main species infect humans. *S. japonicum* and *S. mansoni* adult worms live in the mesenteric veins. Pathology is mainly due to eggs that are swept up into the liver causing periportal fibrosis (hepato-splenic disease) and eggs that damage the intestinal sub-mucosa as they migrate through the intestinal wall to be passed in stool. *S. haematobium* worms reside in the venous plexus surrounding the urinary bladder. Pathology is caused by chronic inflammation and scarring of the bladder and urogenital tract as eggs are passed through the bladder wall and out in the urine. Diagnosis of schistosomiasis is made by examination of stool (*S. mansoni* and *S. japonicum*) or urine (*S. haematobium*) for the presence of eggs.

An 85% of the infected population lives in sub-Saharan Africa, where *S. haematobium*, and *S. mansoni* are endemic. [7] The disease is also endemic in four countries of the Western Pacific region, with 600 million people at risk of infection with *S. japonicum.* [8] Movement of populations and anthropogenic environmental changes that result from water resource development will facilitate the emergence and resurgence of schistosomiasis in areas currently with low endemnicity.

The contribution of schistosomiasis to morbidity and mortality has recently been reassessed using reported symptoms, and available and predicted prevalence of infection data. Such data estimate global deaths to be as high as 200,000 per year in comparison with earlier estimates of 11,000-15000. [8] This recent calculus also found disability estimates between 4-30 times greater than the 1996 Global Burden of Disease analysis. [9] This has placed schistosomiasis as the third most significant tropical disease in the Tropical Disease Research portfolio, following malaria and intestinal helminthiases. Of note, the disability estimate does not include the impact of schistosomiasis on pregnancy.

Morbidity from *S. japonicum* infection in The Philippines

Studies conducted in three *S. japonicum*-endemic rice-farming villages in Leyte, The Philippines, were designed to identify vaccine candidates for *S. japonicum*. Most households do not have running water or electricity. Individuals are infected as they cross waterways, during rice farming, swimming, and doing domestic activities such as cleaning clothing and dishes in the streams.

In this study, we enrolled >500 children and adults ages 8-30 infected with *S. japonicum,* treated them, and followed them quarterly for 18 months. At each time, stool and blood samples were collected and a physical examination was performed. Three weeks after treatment, peripheral blood mononuclear cells were collected and stimulated with *S. japonicum* vaccine candidates so the responses could be correlated with the degree of re-infection with *S. japonicum* in the ensuing 18 months. We also assessed hepatic fibrosis at baseline and the 12 month follow-up using portable ultrasound. At the 18 month follow-up all subjects were re-treated for schistosomiasis and helminth infections identified during the study.

In order to quantify the relationship between *S. japonicum* and cognitive impairment we conducted a cross-sectional analysis at baseline among those 7-18 years. [10] Learning and memory cognitive domains were each defined by three subscales of **the Wide Range Assessment of Memory and Learning** (**WRAML**) and logistic regression models estimated associations between performance in different cognitive domains (learning, memory, and verbal fluency) and helminth infections. After adjusting for age, gender, nutritional status, hemoglobin, and SES, *S. japonicum* infection was associated with poor performance on tests of learning (OR = 3.04; 95%CI= 1.1 – 6.9), *A. lumbricoides* infection was associated with poor performance on tests of memory (OR = 2.2; 95%CI= 1.04 – 4.7) and *T. trichiura* infection was associated with poor performance on tests of verbal fluency (OR = 4.5; 95%CI= 1.04 – 30). The association between *S. japonicum* and learning was of interest as learning

had not yet been studied in this context and may reflect the potential to take advantage of limited educational opportunities in **lesser developed countries (LDCs)**. We were also surprised to find that this relationship was maintained even after adjusting for hemoglobin, a proxy here for iron status. This suggests that *S. japonicum* may affect cognitive processes through mechanisms other than inadequate iron supply for central nervous system functions. Other mechanisms may include distraction from tasks based on symptomatology or the effect of pro-inflammatory cytokines on CNS functions, which cause inattention, a phenomenon seen during acute illnesses known as "sickness behavior."

Two other studies were conducted to determine the etiology of anemia in the context of *S. japonicum.* Using both cross-sectional [11] and longitudinal [12] data from this cohort, we found that the predominant cause of *S. japonicum*-associated anemia is anemia of inflammation, also known as anemia of chronic disease. Anemia in the setting of acute/chronic inflammation is mediated by: 1) decreased erythropoietin production and/or responsiveness of erythrocyte precursors in the bone marrow, 2) decreased erythrocyte lifespan, and 3) shunting of bio-available iron to storage forms and possibly reduced uptake of dietary iron in the gut. Thus, though individuals may be iron replete, this iron is not usable by the bone marrow and other tissues and anemia ensues. Blood loss in stool likely plays a role only at higher intensities of infection. Importantly, anemia of inflammation is the predominant cause among individuals with low or moderate intensity infections, by far the most common intensities of infection. This suggests that anemia is unlikely to be ameliorated by iron therapy alone. Rather, an approach whereby *S. japonicum* is treated and iron therapy is instituted is necessary.

In addition, we sought to quantify the effect *of S. japonicum* on childhood growth and **protein-energy nutritional status (PEM).** Using cross sectional data, we examined the relationship between **height-for-age Z-score (HAZ)** and **body-mass-index Z-score (BMIZ)** and *S. japonicum*.[13] Multivariate models were created to assess the relationship between *S. japonicum* infection and nutritional status after adjusting for age, gender, other helminths, and SES. After controlling for confounders, intensity of *S. japonicum* infection was inversely related to HAZ among children <= 12 years (P = 0.03), but not to BMIZ (P = 0.52) Adjustment for SES allowed a more accurate assessment of the relationship between *S. japonicum* and PEM than was possible in previous studies. In addition, we used our longitudinal data to assess whether children experienced improved growth and PEM following treatment for S. japonicum.[14] HAZ and BMIZ improved modestly but significantly over time following treatment. BMIZ in children nutritionally wasted at baseline improved the most (0.41 [0.26-0.56] Z-score unit) and HAZ improved only in children stunted at baseline (0.17 [0.l2-0.21] Z-score unit). High intensity re-infection at 18 months was associated with significantly less absolute growth from baseline compared to lower intensity and no re-infection. Based on these findings, we recommend that children be treated at least annually to avoid these morbidities.

We were also interested in the mechanisms mediating altered growth and PEM in the context of *S. japonicum.* Using our cross-sectional data, we examined the relationship between growth stunting and PEM and grade of hepatic fibrosis among subjects. [15] Hepatic fibrosis was present in 8.9% of the cohort, the majority of which consisted of grade I fibrosis. Only males had moderate or severe fibrosis (grade II or III; n = 10). Compared to subjects without fibrosis, individuals with mild (grade I) and, even more so, severe fibrosis had significantly lower BMI z-scores, a higher prevalence of anemia, higher levels of C reactive protein (CRP) and greater IL-6 production. Furthermore, severely fibrosed individuals had significantly higher levels of IL-1 compared to those with no or mild fibrosis. These findings suggest that even mild fibrosis is associated with nutritional morbidity and underscore the importance of early recognition and treatment of hepatic fibrosis. In addition, our data are consistent with the hypothesis that hepatic fibrosis causes undernutrition and anemia by systemically increasing levels of the proinflammatory cytokines IL-1 and IL-6. Finally, using our longitudinal data, we found that *S. japonicum* infection was associated with decreased serum albumin levels, (HAZ), and BMIZ (all $P<0.05$). [16] Re-infection was associated with decreased albumin ($P<0.0001$). *S. japonicum* infection and reinfection were positively associated with both serum CRP and IL-6 production. CRP, in turn, was inversely associated with BMIZ and albumin (all $P<0.01$). This suggests that inflammation in general and pro-inflammatory cytokines in particular mediate *S. japonicum*-associated undernutrition.

A major unanswered question in schistosome research is: Why are children more susceptible to both infection with *S. japonicum* and disease due to infection? Because the dramatic changes in susceptibility to infection and disease occur during adolescence, we assessed the role of pubertal development in modulating resistance to infection [17] and disease. [18] In cross-sectional analyses, the intensity of infection among individuals with high DHEA-S levels (a measure of adrenarchy) was 43% lower (28 eggs per gr, n=243), compared with individuals with low DHEA-S levels (50 eggs per gr, n =243), even after adjusting for age, sex, and village (P = 0.01). Following praziquantel treatment, increased DHEA-S levels were associated with resistance to re-infection (P = 0.006). The intensity of re-infection among individuals with high DHEA-S levels was 42% lower, compared with individuals with low DHEA-S levels, even after adjusting for age, baseline intensity of *S. japonicum* infection, village, sex and water contact ($P < 0.001$).

These data suggest that an intrinsic property of host pubertal development mediates, in part, the resistance to infection observed in older individuals.

Because pubertal development is associated with a down-modulation of pro-inflammatory responses, we hypothesized that pubertal development may predict improved nutritional status independent of chronic parasite infections. [18] In cross-sectional multilevel linear and logistic regression analyses, adjusted for confounders, relationships were assessed between 1) DHEAS and nutritional status, 2) DHEAS and proinflammatory cytokines, and 3) nutritional status and proinflammatory cytokines. Independent of age, SES and helminth infections, increased levels of DHEAS were associated with improved nutritional status and decreased prevalence

of non-iron deficiency anemia in both males and females. DHEAS showed a dose-dependent inverse relationship with CRP and production of IL-6 (P=0.08 and <0.0001, respectively). These inflammatory markers, in turn, were consistently associated with undernutrition and anemia. These results suggest that the puberty-associated rise in DHEAS downmodulates proinflammatory immune responses and thereby reduces undernutrition and anemia in a population experiencing a high burden of chronic helminth infections. This novel regulatory mechanism of inflammation-related nutritional morbidity emphasizes the importance of treating pre-pubescent children for helminth infections.

A major goal of our studies was to determine the relationship between immune responses to several vaccine candidates and resistance to re-infecion. [19] In longitudinal analyses a Th2 bias in response to Sj97 (a leading vaccine candidate) predicted a 1.6- to 2.2-month longer time to reinfection ($P < 0.05$) and a 30 to 41% lower intensity of reinfection ($P < 0.05$). These findings underscore Th2-type immune responses as central in human resistance to *S. japonicum* and support Sj97 as a leading vaccine candidate for this parasite.

Future Directions of Morbidity Research

Schistosome infection leads to a wide range of overt and subtle morbidities and these morbidities are largely due to the host's pro-inflammatory response to parasite antigens. In pilot work, we determined that *S. japonicum* is associated with poor pregnancy outcomes and this may be mediated by pro-inflammatory placental injury and deranged maternal iron metabolism. To further assess this potential morbidity, we are conducting a randomized controlled trial to assess the impact of Praziquantel treatment of schistosome-infected mothers on birth outcomes. In addition, our immunology studies have implicated Sj97 as a leading vaccine candidate for *S. japonicum*. We are developing method for the recombinant expression and purification of Sj97 under GMP conditions in preparation for pre-clinical and Phase I vaccine trials.

We are finishing an analysis to estimate the burden of disease from S. japonicum by revising the disability weights assigned to the various specific sequelae of infection. [20] The estimated *S. japonicum* disability weights were seven to 46 times greater than current GBD measures for all schistosomiasis. [8, 9] In the future we plan to study actual reported disability among infected and uninfected children and adults in a large community study in order to provide another independent line of evidence for estimating the human burden of S. japonicum infection.

Ecology and Transmission of S. japonicum in The Philippines

Coincident with studies of immunity and morbidity we conducted interdisciplinary large scale epidemiologic and ecological studies of *S. japonicum* transmission in 50 villages on Samar island, north of Leyte. The overall objective was to develop a generalizable predictive ecological model of schistosomiasis transmission to humans. The model was to include several species, their population biology and behavior, including humans, animal reservoir hosts and snails. The emphasis was on the potential role of irrigation for rice farming and non-human animals on transmission. Using the transmission model, expansion of irrigation, development of water catchments, and interventions on snails and non-human animals can be evaluated formally.

In order to obtain a large representative sample, care was taken in selecting the 50 villages, census of humans and animals, and selection of households and study participants, snail sites, and other mammalian hosts. [21-23] We tried to collect three stools from all humans and all animals over consecutive days, and established an accurate measure of animal infection. [24] Those with at least one stool sample were included in analysis. At baseline, we studied 5623 humans, 1189 dogs, 1275 cats, 1899 pigs, 873 water buffaloes, 663 rats and 730 potential snail sites in 25 irrigated villages and 25 rain-fed villages. After baseline, PZQ treatment was available for all village residents, not only study participants. The 12-month follow-up assessed re-infection in study participants, sampled at random another 35 animals of each species in each village and revisited all potential snail sites to determine ecological, animal and snail predictors of human re-infection.

The adjusted prevalences of humans lightly, and at least moderately infected, varied across villages from 0% (0-3.1%) to 45.2% (36.5-53.9%), and 0% to 23.0% (16.4-31.2%), respectively. Inter-village variation in prevalence is large. [21] The adjusted overall prevalences for dogs, cats, pigs, water buffaloes, and rats were 15.4% (95% BCI:12.6-18.6%), 2.6% (1.5-4.1%), 2.0% (1.2-3.3%), 2.1% (1.3-3.3%), and 32.6% (28.0-37.4%), respectively. [23] The adjusted prevalence for all animals varied substantially across villages. Human infection was highest in males 17-40 years and females 11-16 years. [21, 22] People who worked full-time on a rice farm had higher prevalence of infection than those not working on a rice farm. The villages' irrigation had no effect on human infection prevalence. [22]

In one of our most exciting findings, we estimated that baseline intensity of infection in dogs and cats was associated with intensity of infection prevalence in humans .[22] The ORs of the Bayesian hierarchical logit model showed that a unit increase in the village-level mean eggs per gram (epg) in dogs, cats, pigs and rats, in univariate analyses, were 1.1 (1.0-1.1), 1.4 (1.0-1.8), 1.2 (0.2-5.2) and 1.0 (1.0-1.0), respectively. The association between cat and dog epg and human infection may explain in part why *S. japonicum* is still endemic in areas of the Philippines after implementing human infection control programs. Water buffaloes do not appear to play an important role in the epidemiology of human infection in the Philippines, unlike in China

Further work will explore if additional ecological differences exist between the regions; such as micro-spatial patterning of water flows, snail colonies, human behaviors and rice farms influence transmission. Finally, development of fully specified transmission models seems especially crucial given the difficulties in community adherence to mass chemotherapy for a low mortality disease and the long time horizon for anti-schistisomiasis vaccines. Such models may help us make the most cost-effective decisions about interrupting transmission of infection at different ecological levels from snails, water systems, rice farms, to animal and human fecal disposal and water contact.

Non-Communicable Diseases in the Samoan Islands

The Samoan islands are located halfway between Hawaii and New Zealand. Since the end of World War II, the Samoan islands have rapidly changed and modernized.[25-28] Since 1975 one of us (SMcG) has done public health research in Samoan communities with the support of the Ministry of Health of Samoa, and the Department of Health of American Samoa with an epidemiologic and biological anthropological focus on obesity and **cardiovascular disease** (**CVD**) risk factors. This work has spanned the spectrum from genetic to psychosocial stress studies and now includes public health intervention studies on type 2 diabetes. Here we briefly summarize the impact of modernization or economic development on temporal trends in CVD risk factors among Samoans in the less economically developed nation of Samoa and the more developed US territory of American Samoa. The Samoan temporal trends exemplify, in the extreme, the nutrition transition.

Samoans, along with other indigenous groups across the globe, have suffered from sharp increases in the prevalence of obesity and chronic disease as their lifestyles have become more modernized. Here we report overweight and obesity using Polynesian specific, and body composition validated, standards[27] for BMI: overweight is a BMI of 26-32 kg/m^2 and obesity is BMI > 32 kg/m^2. Between 1976 and 2002, BMI levels and prevalence of obesity continued to drastically increase among American Samoan men and women. By 1990 the percent of obese women increased to 70%, from 51% in 1976-78, and by 2002 it reached 71%. In American Samoan men, there was a dramatic increase from the 1970s to 1990 in the prevalence of obesity, from 28% to 61%, with little additional change in these prevalences in 2002. While levels of overweight and obesity in Samoa are not as severe as those in American Samoa, they too have continued to increase since the 1970s. In men, 56% in the 1970s were of normal BMI, which was reduced to less than one third in 1991 and 2003. In women, the reduction in the proportion of normal BMI individuals was from 34%, to 18% to 17% over the same time period. By 2003 almost 30% of the men and more than 50% of women in Samoa were classified as obese.[27, 28] Levels of overweight and obesity among adults in American Samoa in the 1970s match the levels in Samoa thirty years later.

Children have also been affected. In American Samoa there was a strongly increasing temporal trend in age and sex specific childhood BMI from 1978 to 2002. The mean BMI increased over the 24 years ranged from 1.9 to 3.8 kg/m^2 in boys and girls 6-11 years of age. In adolescents 12-17 years of age, the temporal BMI increases ranged from 3.6 to 5.8 kg/m^2 in boys and 4.9 to 5.8 kg/m^2 in girls. Approximately 70% of boys and over 80% of girls 15-17 years of age in American Samoa in 2002 are overweight or obese, using international BMI standards for youth.[29] In girls 12-14 years of age over 65% are overweight or obese. Even among the youngest American Samoan boys and girls 6-11 years of age, only 49% to 56% are of normal BMI. In Samoa, the proportion of overweight and obese children is quite a bit smaller than in American Samoa.

Children measured in Samoa between 1979 and 1982 had a very low prevalence of obesity. Between 1979 and 2003 there was a four-fold increase in the prevalence of obesity among boys and an almost eight-fold increase in the prevalence of obesity among girls. In 2003 about 77% to 86% of boys of all ages are of normal BMI. In girls from Samoa in 2003, the proportions of those who are overweight or obese ranges from 21% to 26% in young girls but rises to 37% to 39% in 12-17 year olds.

Contemporary Samoan adults have not escaped obesity-related Type 2 diabetes. [28] The prevalence of diabetes among men 25-54 years from American Samoa in 1990 was 12.9%; by 2002 prevalence in the same aged men was 17.2%. Over all adult ages, 18-74 years, seen in 2002 in American Samoa type 2 diabetes prevalence was 21.6% in men and 18.0% in women. In women 25-54 years of age from American Samoa prevalence doubled from 8.1% in 1990 to 16.7% in 2002. Diabetes prevalence in Samoa was far lower at each time for both sexes in contrast with American Samoa. But from 1991 to 2003 there were striking increases in diabetes prevalence in all sex and age groups. For example, prevalence was 2.4% in men 25-54 years in 1991 but 6.0% in 2003. Likewise in women, prevalence rose from 3.0% to 8.2% in those 25-54 years. In 2003 when a wider age range was sampled diabetes prevalence in Samoa was 9.3% and 12.6% in mean and women, respectively.

From the earliest studies through the present, the prevalence of elevated blood pressure has been quite high among Samoans. [25, 28] We define hypertension as a blood pressure +140/90 mmHg, or on anti-hypertensive medication. Across all age groups, American Samoan men had a prevalence of hypertension of almost 40% in 1976-1978 and 46% in 2002. In 2002 among all the age groups 35 years and older more than half of the American Samoan men had hypertension. American Samoan women of all ages had a hypertension prevalence of about 35% in the 1970s and 31% in 2002. However, in those 55-74 years at each time hypertension ranged from 57% to 67%. In less modernized Samoa hypertension prevalence is not as extreme as in American Samoa, but is still quite high. In 1979-1982 in Samoa, 17% of men and 12% of women 18-74 years had hypertension. By 2003, hypertension prevalence had increased to 30% in men and 29% in women, with the highest proportions among those 55-74 years of age.

The high and increasing levels of obesity and CVD risk factors over the past 30 years among Samoans, and now its appearance in children suggest that this trend may worsen before leveling off. In addition, the rapidly increasing prevalence of obesity among children, especially those living in American Samoa, suggests that the epidemic may shift to younger age groups. If these trends continue, chronic disease will remain a major determinant of health in the Samoan islands. In the future there may be an earlier onset of chronic disease, and consequentially a decrease in quality of life and life expectancy.

These data illustrate the immediate need for intervention in the Samoan islands. We have made a small start through a new translational research grant aimed to help management of type 2 diabetes. We will use community health

workers to provide outreach to patients and their families, and will work with providers in a primary care setting to track adherence and blood glucose control. We also hope to conduct behavioral interventions among overweight Samoan adolescents.

Conclusion

We have attempted to show the wide range of global health research conducted in the Asia Pacific region on both infectious parasitic diseases and NCD. The dual burden of these conditions as a result of the process of the health transition is found in both locations highlighted here, as well as many other nations. Despite large regions of rural poverty and parasitic infections The Philippines is also experiencing a rapid rise in CVD risk factors. [30] Likewise, infectious parasitic diseases exert a morbidity burden in the Samoas. [31]

Our aim is to continue to perform interdisciplinary biomedical and public health research on infectious diseases and NCD in The Philippines and the Samoan polities. This fundamental research will allow us to conduct translational and policy-oriented research which can directly inform best clinical and preventive practices. Meanwhile, we are acutely aware that the distribution of resources during the globalization process may not equally benefit all study populations. We hope that our research will contribute to fundamental progress in knowledge about these diseases but also to sustainable improvements in population health and material ways of life in these communities.

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Perspectives from Brown Medical Students and a Medical Resident

The Warren Alpert Medical School in the Dominican Republic

David Sears, MD

He was a young man, perhaps 23 or 24, certainly no older than I. It must have been 90 degrees in the emergency room that evening, and he was sweating. He was sitting bolt upright on the gurney with his hands gripping the side railing. His neck was rigid and extended toward the ceiling, meaning he had to look downward to see me. He was breathing heavily through clenched teeth. He looked afraid. A deadly tetanus toxin was coursing through his blood.

It was February 2005 when I saw this patient in the emergency room at Hospital José María Cabral y Baez in Santiago. I was a third-year medical student, spending a month in the Dominican Republic with a group of classmates, internal medicine residents, and attendings from Brown Medical School. A four-hour flight separates Santiago from the major cities of New England, but this large public hospital might as well have been in another world. Disease was rampant; patients had to pay for most diagnostic tests and treatments before they could receive them, and the minimal laboratory and imaging modalities were unreliable.

Over the next few weeks our group attended didactic conferences in the hospital, worked with physicians in the outpatient HIV clinic, went on rounds, and evaluated new patients in the emergency room. We saw an enormous array of pathology, from infectious disease staples like dengue, malaria, leptospirosis, and advanced HIV, to a range of zebras such as relapsing polychondritis, Ludwig's angina, and neurofibromatosis. More importantly, we experienced a health care environment that is vastly different from our own, and we saw the challenges that this system created for the men and women providing medical care and the patients who sought their services.

When I returned to Rhode Island, to what suddenly seemed like the very comfortable life of a medical student, I had a hard time letting go of the things I had seen and the people I had met on my brief trip. By the end of the year I found myself in Santiago again, this time for a nine-month period that I spent developing Brown Medical School's service projects in the country. These projects include a medical exchange program and an HIV treatment and prevention initiative. Our focus is to provide valuable services to the neediest patients and to teach and learn from our Dominican colleagues in ways that greatly benefit our mutual growth as physicians. Basing this program in the heart of the Dominican Republic also has a number of benefits for our work back home; 10.3% of Rhode Island's population is Latino or Hispanic (including 30% of Providence residents) and a large proportion of this population is of Dominican origin.[1] Furthermore, the rise in the Dominican middle class means that more people are traveling between the two countries. Quality medical care requires not only an understanding of the wide breadth of illnesses seen in this immigrant community, but also competence in the cultural, linguistic, and social context of those illnesses.

Under the leadership of Mark Fagan, MD, of Rhode Island Hospital and Joe Diaz, MD, of Memorial Hospital, the exchange program that I joined in early 2005 has expanded while maintaining its strong ties with Cabral y Baez, the hospital in Santiago. We now also see outpatients at a free rural clinic called Pequeños Pasitos, established by a Dominican-American couple. Participants from Brown, including residents and physicians from the Department of Family Medicine at Memorial Hospital, bring medical supplies to the clinic, see patients with the Dominican doctor on staff, and work on public health projects. The exchange program is also integrated with tropical medicine and medical Spanish curricula to further develop language and clinical skills that are invaluable both in the Dominican Republic and upon our return to Rhode Island. To ensure that the benefits of the program do not flow in one direction only, internal medicine residents from Santiago rotate through the Brown hospitals to learn from our health care system.

In addition to the exchange program, Brown lends vital support to the large outpatient HIV clinic at Cabral y Baez. The HIV pandemic has ravaged the Caribbean: an estimated 1.1% of adults in the Dominican Republic are infected with HIV[2] and less than 20% of those in need of antiretroviral therapy are receiving it.[3] In efforts spearheaded by Michael Stein, MD, of Rhode Island Hospital, Brown has greatly improved the quality and quantity of HIV care in Santiago. We hired an excellent Dominican physician to work alongside the two physicians who were volunteering in the clinic but could not keep up with the influx of new patients. We organized the donation of computers to the clinic, which enabled the implementation of an electronic medical record-keeping system. The electronic records allow Dr. Stein to lend medical expertise in the management of difficult cases. In addition, we have supported the education of adherence and prevention counselors and organized the donation of thousands of condoms and medications.

Through the efforts of volunteer physicians and students we have improved the care of thousands of patients in places like Pequeños Pasitos, the inpatient wards in Cabral y Baez, and the outpatient HIV clinic. The more lasting effects of these initiatives, however, will be in the foundation that these programs lay for the training of Dominican and American students and medical residents. While it is important to return from the Dominican Republic with a better understanding of diseases like cerebral malaria and dengue, it is even more important to return with a renewed sense of social consciousness and purpose. Often this comes at a time when program participants are making decisions that will define their medical careers. I know this because I am one of those people, and I am certain that as I navigate down my career path, the memories of the people I worked with and the patients I was fortunate to know will guide my decisions.

The young patient with tetanus whom I encountered in the ER that evening died on his third day in the hospital. His death, so easily preventable, represents a failure of so many societal, po-

litical, and economic systems that the geographic barriers dividing us become inconsequential, and we should all feel responsible for his passing. It is patients like him—or the thousands of Dominicans who still need antiretroviral medications, or the legions of pregnant women and elderly farmers waiting for appointments at Pequeños Pasitos—who remind us of the work that needs to be done. The commitment of the Brown community to the programs in the Dominican Republic has been substantial, and the progress made has been impressive, but satisfaction with our achievements will not solve the health problems that plague the populations we serve. A further investment of resources—both human and financial—is needed. These resources must go toward caring for patients now, but they must also be invested in the development of generations of like-minded health care professionals, both Dominican and American, who will carry on the tradition of service to our deeply intertwined communities.

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Going Home: Lessons for a Brown Medical Student in Cambodia

E. John Ly, BMS IV

For many reasons, my first visit to Cambodia—one of the poorest countries in Southeast Asia—was the richest experience in my life. In the summer of 2005, with the support of a scholarship from the Infectious Disease Society of America, a Foreign Studies Fellowship from Brown University's International Health Institute as well as contributions from family and friends, I worked on a project at **Angkor Hospital for Children (AHC)** in Siem Reap, Cambodia.

AHC is a non-profit hospital that opened in 1999 with the support of internationally-acclaimed Japanese photographer Kenro Izu and his New York City-based fundraising branch, Friends Without a Border. Since its inception, the hospital has provided free healthcare to mostly poor, rural children in northwest Cambodia. To date, it is staffed predominantly by local Cambodians, serves as one of the only pediatric teaching hospitals in the country and has provided care for over 400,000 children.[3] Recently, it developed a strong relationship with the Warren Alpert Medical School and has been a site of active exchange of medical personnel at all levels of training.

This trip was especially meaningful to me because I was returning to the country that my parents left as refugees 25 years earlier. Ostensibly, I left to carry out research related to pneumonia; but in the process, I returned having learned lifelong lessons about health, development, and myself. As a novice, I stumbled through the usual obstacles of working abroad: getting IRB approval, finding funding, setting up the logistics of the project and adjusting plans as needed. But I knew the difficulties of my journey to Cambodia, however frustrating, paled in comparison to those of my parents' journey to the US; their harrowing voyage involved a 200-mile trek through dense forests, a protracted stay at a Thai refugee camp, and a plane ride to a country whose language and culture were completely foreign to them.

With the help of my advisor, Dr. David Pugatch, and colleagues at AHC, I developed a project based on one of the needs that had been expressed. The initial plan was to carry out a blood culture study to determine the causative organisms in bacterial pneumonia among patients at AHC. One of the focuses was to elucidate the rate of *Haemophilus influenzae* type b (Hib) disease burden, in hopes of providing evidence to support the routine administration of Hib conjugate vaccines in Cambodia.

While Hib vaccines have been in use in the US and other developed countries for over a decade and have dramatically reduced the rate of Hib disease—most notably meningitis, epiglotottis and pneumonia—Hib vaccines are not widely used in developing countries. The prohibitive factor has been the cost. Currently, Hib vaccines cost around US$7 per child for the recommended three doses, roughly seven times the total cost of vaccines against measles, polio, tuberculosis, diphtheria, tetanus, and pertussis.[3] While it is most likely cost-effective to make Hib vaccines available to developing countries, efforts to demonstrate Hib disease burden have been inadequate, and that has been a barrier to introducing vaccine programs.

As a testament to the fractured state of healthcare in Cambodia, we could not proceed with our original study design because many patients admitted for pneumonia had already received some antibiotics and blood cultures would be less effective in detecting any pathogens. These patients were getting antibiotics from a variety of sources—regional health clinics, private pharmacies and marketplaces—before presenting to AHC. There is no system of prescriptions in Cambodia. The majority of patients bought antibiot-

Each day, hundreds of patients get processed through triage at Angkor Hospital for Children. (photographer: Daniel Rothenberg)

ics from outdoor marketplaces, often from untrained store keepers. While the government had set up regional health centers, the government had not invested money in staffing the clinics. The doctors and nurses who staffed these facilities were paid $20 a month - less than the median annual income of $300.[3] In order to support their families, many of the clinic staff took second jobs, with some opening pharmacies in outdoor marketplaces. Therefore, government clinics were regularly understaffed. Workers would come in late, irregularly, or not at all. Local residents did not rely on these clinics and instead went to the marketplace pharmacies for drugs before being seen by a healthcare worker.

This failure in the system was not isolated. There seemed to be an underinvestment in education as well and these problems contributed to the stark inequities that were readily visible: shiny Land Cruisers shared the road with ox-carts; five-star hotels filled with well-healed tourists were down the street from make-shift shacks crowded with out-of-town squatters looking for work.

Whether on the streets or in the hospital, I found many things discouraging. On daily afternoon rounds at the hospital, we came across many sick patients. Children were afflicted with end-stage AIDS, rheumatic heart disease, miliary tuberculosis and acetaminophen toxicity, among other illnesses. Many of their diseases were preventable or would be treatable in the developed world. This was especially difficult for me to consider, since I felt a strong connection to the children there. Besides luck and circumstance, I saw little difference between myself and them. Where I had been given a wealth of education and the fortune of health, they—victims of poverty and injustice—lay sick or dying.

Despite the multitude of dispiriting realities, there was much to be hopeful for even if it was moving at a sluggish pace. This was perhaps best exemplified on our visits to the re-feeding ward, where our afternoon rounds finished each day. Children who had presented with severe malnutrition were being re-fed carefully, with small increases in their caloric intake, to prevent re-feeding syndrome. Though slowly, they were surely getting better. Like these children,

A resident examines a patient in the inpatient department at Angkor Hospital for Children. (photographer: Daniel Rothenberg)

Cambodia appears to be slowly recovering from the starvation of its war and genocide. And as with all developing countries, Cambodia's future success depends on the world's commitment to ensuring a basic level of opportunity that includes adequate health.

Work continues at AHC; and like the numerous people who have volunteered there, I plan to return. While I try to contribute I know that, through the relationships formed and the lessons learned, I have received much more than I could ever give.

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"Village Health Works" in Burundi

Natasha Rybak, MD

As a fourth year medical student and the medical student representative of the newly formed Internationalization Committee within Brown University, I have been amazed at the dedication and involvement of many faculty and students in international health. As the Internationalization Committee strives to accentuate Brown's international strengths, it also is working towards creating initiatives to improve Brown's future role in an array of international realms.

Burundi is a small country in East Africa with a population of over 7 million people. It shares much of the cultural and ethnic history of its neighbor Rwanda. Following years of civil strife and genocide, Burundi is struggling to support its people. With the violence of the 1990s largely behind it, Burundi's mortality figures are still among the worst in the world. The average life expectancy is 39 years. In March, 2005, the United Nations reported that one out of every five people in Burundi dies from water-born diseases and poor sanitation. Malnutrition rates for children under 5 were reported to be 56% in 2000.[3] Malaria, the leading cause of death in Burundi, is estimated to account for greater than 50% of people seeking medical care. [3] Burundi has a total of 156 practicing physicians, More than half work in the capital, where only 8.4% of the population resides.[3] For rural Burundians, access to proper healthcare is sometimes nonexistent.

I spent the summer of 2006 in Burundi on a Foreign Studies Fellowship from Brown University's International Health Institute. I was based in Rumonge, Burundi, located on Lake Tanganyika, a region severely affected by malaria, in addition to yearly epidemics of cholera and constant parasitic infections. My friend, Deogratias Niyizonkiza, now an American citizen, grew up in Burundi. He talked often about his home country. He encouraged a group of people to come to Burundi, each with different talents including several medical students, an Emergency Department physician, an architect, a journalist, and a literary agent. Deogratias detailed the tremendous needs and his desire to create a health clinic to provide high quality medical care to patients. He mentioned that they lacked microscopes

to diagnose malaria and that he had collected some microscopes for use there. Interested in going to Burundi and in finding a way to help, I started reading about the diagnosis of malaria.

I decided to create a project to bring diagnostic equipment to Rumonge for the diagnosis of malaria. The aim of this project was to implement standardized microscopic diagnosis of malaria in Rumonge Hospital while evaluating and comparing it to clinical diagnosis. In preparation for my trip, I applied for and received $850 of funding from the Dean's Independent Scholars Fund to pay for the additional microscopic supplies. Spending time with my parisitologist professor, I carefully examined slides that had been vigilantly stored for years as the last surviving malaria specimens in the school. I also visited the Rhode Island Hospital patient laboratory and practiced creating the perfect "feathery" edge on the slide for my thin blood smear.

Yet none of this prepared me for the Rumonge Hospital. Working internationally is most of all a lesson in flexibility and patience. Upon arriving, I realized that the conditions of the hospital had changed rapidly. Clinical diagnosis was no longer the predominant method of malarial diagnosis, because they had recently received one microscope and had instituted microscopic diagnosis as the sole method of diagnosis. Other changes included a new government program to provide medical treatment free of charge to all children under 5 years old. This was a very important step in improving health care, but fraught with difficulties as the hospitals filled up and medications and staff were quickly exhausted.

Recognizing that my proposed project would not work, I discussed with medical staff in Burundi and fellow colleagues ways to utilize my time in Rumonge wisely, without hindering the busy staff at the hospital. I decided to evaluate the barriers to good health in Burundi and spent most of my days rounding with nurses and a fellow Brown medical student and an ED physician from NYC. Working with Deogratias Niyizonkiza, we knew that to create a health clinic in Burundi we would have to learn about the diseases and barriers to care.

The lessons we learned in the hospital were invaluable. We saw patients with severe diabetes who could not afford insulin, and patients suffering from malaria, intestinal parasites, and pneumonia. A woman suffering from eclampsia was taken in a taxi by her family to the capital because nothing could be done for her in the Rumonge Hospital. Many pregnant women were hospitalized for severe malaria and several gave birth prematurely. No mother-to-child transmission of HIV prevention was in place in the Obstetrics clinic. We learned about the processes that bring patients to the hospital, the trends, depending on age and financial status. We visited other hospitals, including a private hospital, and saw the differences in care and patient demographics. Some patients walked miles just to come to the hospital. Other patients never came to the hospital, avoiding it for its high fees and instead preferring to go to the local pharmacy and buy the medications they felt most likely to cure them. Often these medications partially treated their infections or masked signs of serious illness.

We spent time in the village of Kigutu, near Rumonge, which is situated among several hills near Lake Tanganyika. Deogratias, who had spent several years working for Partners in Health in Haiti and Rwanda, knew from firsthand experience the work that goes into creating sustainable, quality health clinics and saw this as a vision for the village of Kigutu.

When we first arrived in Kigutu, we could feel the excitement of the villagers kilometers before we reached our destination. Children ran to the road and followed our vehicle, laughing, delighted by our waves. As we pulled into the field we were immediately surrounded by hundreds of villagers, eager to show us the pile of bricks and stones they had collected for the foundation of their long awaited health clinic.

As our small group spent more time in Burundi, the plans for an expandable model health clinic in Kigutu unfolded. After a night of brainstorming, the name "Village Health Works" was created and the organization officially began. The vision of **Village Health Works** (**VHW**) is based on the principle that all people—including the most oppressed and impoverished—are entitled to the highest standards of health care in their pursuit of happy and productive lives. Working with the Kigutu community is the most important principle of the organization and integrating community members into every phase of VHW projects will serve to create a lasting partnership that will be crucial in helping people improve their own health and lives. Village Health Works hopes to initiate and strengthen health care facilities, in addition to securing clean water and safe food, basic education and economic opportunity.

Armed with the knowledge of barriers to care, we hope to improve health care for the people of the Kigutu region by eliminating these barriers and inspiring hope in a population devastated by trauma. Hope can sometimes be one of the best contributions to health.

Upon our return from Burundi, our small group, with the help and support of many close and dedicated friends, including Partners in Health, worked together to make Village Health Works live up to its name. In a few months, from August to November, Village Health Works became a not-for profit 501(c)3 organization and raised over $400,000. This money was used to finish the first clinic building, construct two more clinic buildings, and provide medications and equipment. In the summer of 2007, one physician and 2 nurses, chosen by the Minister of Health of Burundi, traveled to the Partners in Health site in Rwanda and were trained for patient care.

Current plans are to begin seeing patients in November 2007.

If you are interested in learning more about Village Health Works please visit our website at http://www.villagehealthworks.org or contact Natasha Rybak at tasharybak@gmail.com.

We need your support! Look for upcoming events with Village Health Works in the Providence area!

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Brown In Kenya

Edward J. Wing, MD

We landed in Nairobi, Kenya, at 10 o'clock at night after an 18-hour flight from Boston. My fellow travelers were Jane Carter, a pulmonologist in private practice and a former Brown medical student. The airport appeared old and dark, the air hot and humid Our bags were lost - it took us more than two hours to report them missing. The remaining part of the night was spent under mosquito netting in a hotel. The next day we traveled northwest, across the equator through what seemed like a primal land, with broad vistas of savannah, valleys, traditional villages and wild animals. We arrived in Eldoret, a city the size of Providence, in the afternoon. The next day I rounded on the wards, on approximately 40 patients, with Kenyan and Brown medical students. Chest x-rays showed the ravages of HIV, tuberculosis and pneumonia. One out of 10 patients died every day. The need was overwhelming. A young patient of mine died of preventable complications of tuberculosis meningitis one day after I left.

The experience changed my perception of medicine and made me acutely aware of the needs in the rest of the world and the wealth of the USA. As a result, along with many members of the faculty of the Department of Medicine including residents, students, and fellows, we have developed a number of programs throughout the world. The programs, their directors, and contact numbers are listed below. I invite interested physicians and students to risk having the same adventure that I did, and to have a life-altering, wonderfully enriching experience.

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India: Chennai, Pune - Fogarty, Research	
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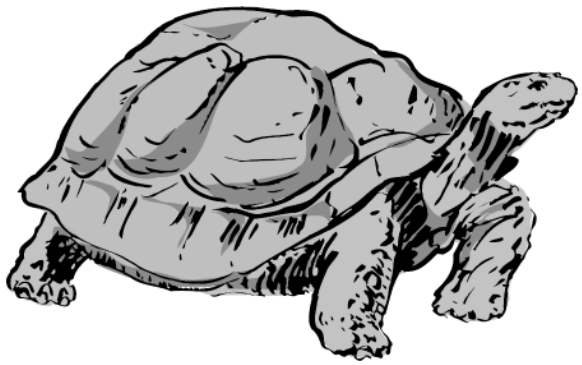

Caring for HIV-Infected Refugees in Rhode Island

Simon Desjardins, Curt G. Beckwith, MD, Heather Ross, LCSW, Lauri Bazerman, MS, Jennifer A. Mitty, MD, MPH

In 1988, the Office of the United Nations High Commissioner for Refugees (UNHCR) stressed that States and the UNHCR are obliged to offer resettlement programs to those in need of care, including those who test HIV seropositive.[1-2] The United States did not heed this non-exclusion policy, and with the Immigration and Naturalization Act, found practically all HIV-positive refugees inadmissible.[3] The Refugee Act of 1989 granted the Attorney General discretion to waive the HIV-positive exclusion for certain refugees.[4] However, due to a provision set forth by **The United States Citizenship and Immigration Services (USCIS)** (then called the **Immigration and Naturalization Services (INS)**), an HIV-positive refugee had to first prove that "there would be no cost incurred by any level of a government agency in the US without the prior consent of that agency."[5] This was such a difficult task that few of the 2.3 million refugees who resettled in the Unites States between 1975 and 1999 were HIV-positive.[3] On June 16, 1999, the USCIS revised its policy, making it no longer necessary for HIV-positive refugees to prove that they would not be a financial burden on government-funded programs.[4] Since this revision, from the fiscal years of 2000 to 2004, out of the 340,171 refugees who gained entrance into the United States[6], 1057 (0.31%) were HIV positive.[7]

Being a refugee is a risk factor for acquiring HIV as well as tuberculosis, parasite infections, and viral hepatitis.[8] Poor nutrition, the breakdown of the healthcare infrastructure and immunization programs, and the exposure to physical and psychological stressors contribute to this risk.[8] In addition, the conditions that underlie conflict, such as poverty, powerlessness, social instability, and marginalization also contribute to psychological trauma.[1] Due to limited or nonexistent healthcare in their countries of origin, refugees have substantial healthcare needs upon arrival to the United States. HIV-infected refugees may have limited or no understanding of the natural history of HIV disease, how it is transmitted, and whether treatment is available and effective. Furthermore, many may consider HIV a "death sentence" since they may have witnessed family members of friends dying from HIV in their home countries.

Data describing the HIV-infected refugee population are sparse. Moreno and co-authors demonstrated through a retrospective chart review of refugees receiving care at Boston University that HIV-infected refugees present with complex health needs, and that efforts to deliver care to this highly vulnerable population should include screening for infectious diseases common to immigrants from developing countries and assessment of psychological conditions such as depression and **post-traumatic stress disorder (PTSD)**.[3] To provide high quality clinical care to refugees, healthcare teams need to offer extensive support and empathy and demonstrate an appreciation of the values of this diverse group of individuals.

Cartwright and co-authors reviewed HIV among infected refugees in Minnesota, who were mostly from sub-Saharan Africa, and found an increasing proportion of HIV variants.[9] Although most persons who acquire HIV in the United States acquire clade B virus, clades A, C, and D were observed among the refugees in this study. These differences in HIV clade are important. Different clades may affect the ability to use HIV viral load assays approved for clade B virus and the ability to identify resistance mutations relevant to antiretroviral therapy.

Review of the HIV-infected refugee population receiving care at the Immunology Center of The Miriam Hospital in Providence, RI

Of the 340,171 refugees who entered the US between 2000 and 2004, 1467 (0.43%) resettled in Rhode Island;[6] 42 (2.3%) were HIV-positive. This translates into a rate of HIV-positive refugee resettlement in Rhode Island that is 7.4 times greater than the national average. In Rhode Island, the resettlement process involves a local resettlement agency, the **International Institute of RI (IIRI)**, working with local HIV providers to assure HIV care upon resettlement. The IIRI and the Immunology Center of The Miriam Hospital have formed a partnership that has facilitated the resettlement of HIV-infected refugees. The Immunology Center is the largest provider of HIV care in the state and provides comprehensive primary care for HIV-infected persons including social work, mental health, and substance abuse services. Since the majority of HIV-infected refugees receive care at the Immunology Center, we have a unique opportunity to examine the challenges of caring for this population.

The challenges include cultural and language barriers, difficulty with engaging refugees in longitudinal care, and the presence of other medical co-morbidities. We presented a synopsis of our HIV-infected refugee patients at the 44th Annual Meeting of the Infectious Diseases Society of America.[10] The medical charts of 47 HIV-infected refugees who established care at The Miriam Hospital between 2001-2005 were retrospectively reviewed. The study examined demographic variables, HIV history, medical co-morbidities, and barriers to HIV and primary care.

The median age of this population was 37 (range 21-47), with 60% female. Sixty-eight percent of the refugees emigrated from Liberia, and 57% originated from refugee camps in West Africa. This was not surprising given the strong historical ties between Liberia and Rhode Island. (Providence has one of the largest populations of Liberian immigrants in the United States.) The main risk factor for HIV infection among the refugees was heterosexual sex, with 81% of the refugees reporting it as their primary HIV risk factor. In contrast, in the United States as a whole, male-male sexual contact remains the number one risk factor for HIV infection followed by heterosexual sex and injection drug use.[11] Among the refugees, the median CD4 count upon entering HIV care was 434 cells/ml (range 20-1252) and the median HIV-1 plasma rival load was 8981 copies/ml (range <75-

>500,000). Of 44 patients whose initial CD4 counts were obtainable, 16% (7/44) had AIDS when care was initiated. Fifty-three percent of the refugees completed baseline HIV genotype testing looking for HIV resistance in persons who had never received antiretrovirals in the past. Two of the 25 patients (8%) for whom data were available had baseline HIV resistance which was comparable to an estimated 7% within the general patient population of The Immunology Center.[12] Thirty-eight percent began antiretroviral therapy within the first 12 months of care. Forty-five percent of the refugees were thought to have had a history of depression or post-traumatic stress disorder; 32% had anemia at baseline; and 19% were positive for hepatitis B surface antigen.[10]

In addition, 39% of the female refugees became pregnant since arrival to the US; 23% completed screening for parasite infections following initiation of HIV care; and only 13% possessed vaccination records. The low completion rates for parasite screening, which is recommended upon resettlement from endemic areas, is likely due to a combination of patients not complying with stool analysis and providers failing to order the testing. Given limited or nonexistent vaccination records, the majority of refugees needed to initiate full vaccination series once care was established.

Challenges of caring for refugees

By definition, refugees flee their country to escape persecution. Typically, they have little or no control over their destination. Psychological and physical trauma are common. Many reside in refugee camps for years prior to resettlement in the US. Those camps can be dangerous without provision for healthcare, education, or employment.

Prior to resettlement, refugees undergo HIV testing. Communication of HIV test results to the individual does not always occur. Some refugees learn of their HIV-positive status following resettlement. Those who do learn of their infection prior to resettlement, often deny the diagnosis. One of the greatest challenges for HIV-providers in the US is to create a trustful provider-patient relationship during the traumatic time of relocation and to communicate the meaning of their HIV diagnosis.

Several elements of HIV education need to occur with a newly resettled refugee. First, the provider must be sure that the refugee understands the HIV diagnosis and basic facts about the disease. This discussion includes an explanation of the expectations of the provider, including regularly scheduled appointments and the use of laboratory tests for monitoring HIV disease (CD4 cell count and HIV plasma viral load). These discussions can be complicated if the refugee has been raised in a culture where traditional medicine has produced a different understanding of HIV infection. Some refugees attribute their infection to "witchcraft" and believe God will cure their illness. For these patients, the provider should respect those traditional beliefs while at the same time developing a care plan that will enable monitoring of HIV disease.

HIV treatment, including the indications for treatment, need to be discussed. Treatment can be complex and decisions are based upon the immune status of the patient. For refugees with an intact immune system, treatment will not necessarily be recommended upon initiation of care. In our experience, it can be difficult for refugees who have limited knowledge of HIV disease to understand why treatment would not be started right away. They may believe that medications were wrongly withheld from them. Explaining the rationale behind delaying treatment and building a sense of trust with the refugee may require multiple visits and help from social workers and IIRI staff members. At the same time, refugees in need of treatment based upon a low CD4 count, but who are asymptomatic, may feel that treatment is not necessary. In this scenario, the patient may not take the prescribed medications. An outreach nurse may be able to assist with medication adherence.

Finally, the provider must discuss ways to prevent HIV transmission between sexual partners. This can be difficult for persons from cultures where sexual activity is not discussed openly. With respect to pregnancy, we generally counsel our patients to practice safe sex and to avoid pregnancy given the risks to the child. However, refugees who have experienced a tremendous loss of family may want to create a new family. Our data suggest increased rates of pregnancy among the HIV-infected refugee population. This has led to considerable efforts aimed at educating refugees of child-bearing age about the importance of discussing pregnancy with their HIV provider to ensure measures are taken to reduce the risk of mother-to-child transmission of HIV.

Conclusion

Language barriers, lack of understanding of cultural differences, fear of disclosure of HIV status to the community, a general lack of understanding of preventive health care, and the integration of HIV care into the unsettled process of refugee relocation – all impede the care of refugees who are HIV-infected. Further research is underway, examining the differences between the HIV-infected refugee population and the HIV-infected non-refugee population in order to better characterize the needs of the refugees. In addition, an in-depth analysis of the increased rate of pregnancy among the refugees is being completed to better understand the outcomes of the pregnancies. These data will be used to inform providers who care for this vulnerable population. Despite all of the challenges, many of our patients have successfully integrated into their new communities. However, working with this population requires the collective efforts of IIRI staff, social workers, translators, outreach workers, case managers and physicians.

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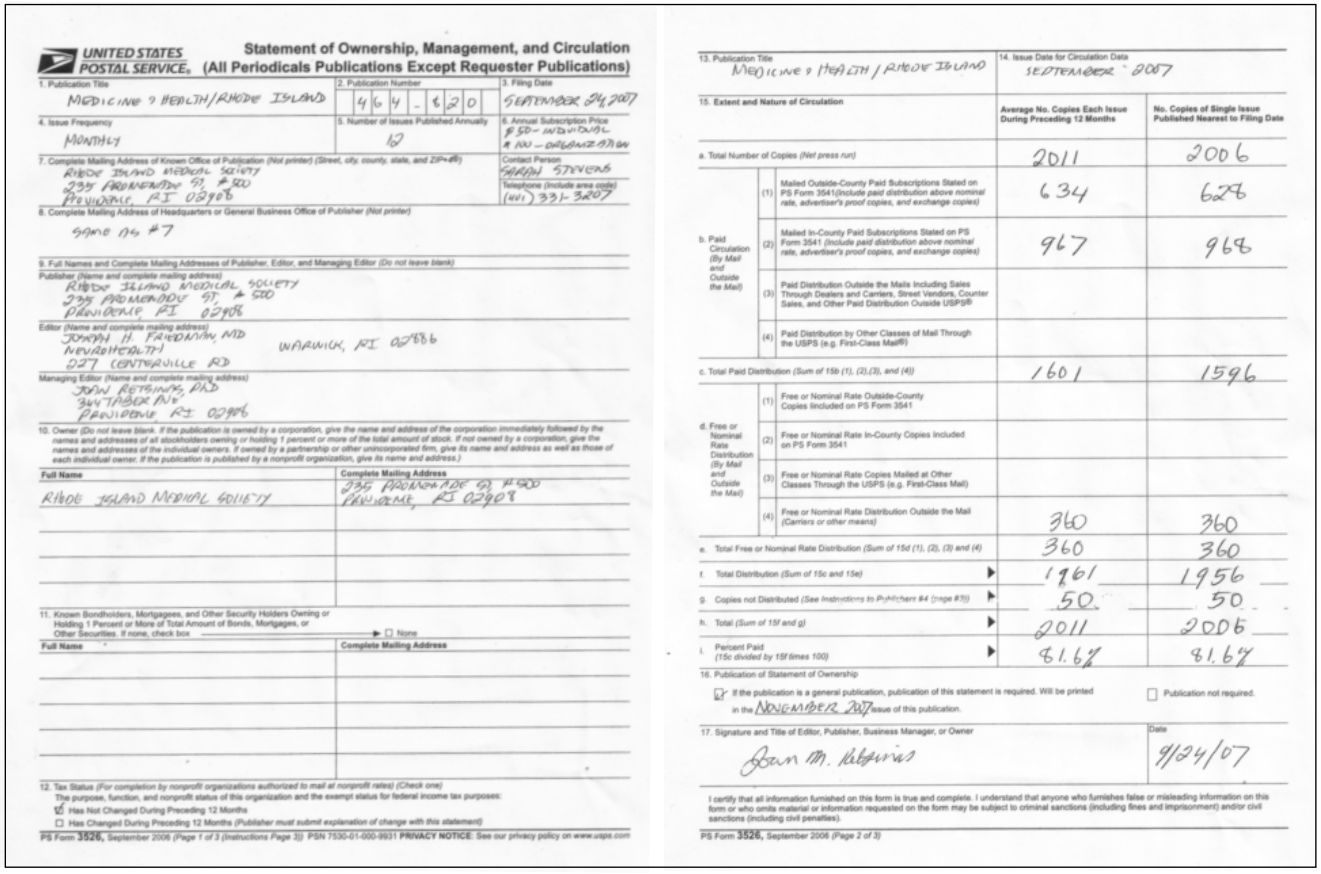

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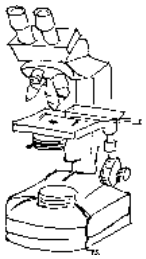

The Creative Clinican

Tuberculosis Peritonitis

Joseph D. DiMase, MD, FACG, FACP, and Deepak Agrawal, MD

A case of peritoneal tuberculosis in a foreign-born person is reported, where the diagnosis was established after two weeks of hospitalization. The **Centers for Disease Control and Prevention (CDC)**[1] estimate that 50% of all cases in the US occur in foreign-born persons. As of 2005, the rate was eight times that of US-born. Rhode Island has followed the national trend.[2] Because resistant strains have developed and because the disease can be fatal, early diagnosis and treatment may be life-saving.

Case Report

A 66 year-old man from the Dominican Republic, in RI for the past 14 years, was admitted with the chief complaint of progressive abdominal distention. He was in his usual state of good health until one and a half months prior to admission when he developed increasing abdominal distention accompanied by fatigue, generalized weakness, and anorexia with a 10 pound weight loss. He reported having chills and fever one month previously, which spontaneously resolved. He denied abdominal pain and other GI or pulmonary symptoms. There was no history of alcohol use, confirmed by his family, and no history of tuberculosis exposure. He had been taking no medications.

His temperature was 98.1, BP 118/71, P 82, and R 20. Pulse oximetry on room air was 97%. He appeared cachectic but was in no obvious distress. There was no adenopathy. Decreased breath sounds were noted at the right base. Cardiac exam was normal. The abdomen was markedly distended with a positive fluid wave. No abdominal masses were felt.

Lab data

WBC 3.6, Hgb 9.6, platelets 587,000, electrolytes, BUN, creatinine, glucose and liver tests were normal with the exception of an albumin of 2.0 grams/percent. Iron level was 14 ug/dl with a TIBC of 146 mg/dl and a ferritin level of 318 ng/ml. Hepatitis panel was negative. Blood cultures and cytology on peritoneal and pleural fluid were negative as were stains for acid fast bacilli. An abdominal CT revealed a moderate right pleural effusion, a 6 mm pulmonary nodule at the left lung base, marked ascites and a dilated transverse colon, greater than 6 cm. CT of the thorax showed a 6 mm nodule at the left base, a large right pleural effusion, and a partial upper lobe and right middle lobe atelectasis. A tuberculin skin test (**PPD purified protein derivative**) was negative.

Hospital course

Abdominal and pleural fluid analyses revealed exudates with a predominance of lymphocytes. AFB smears were negative. Because of the iron deficiency anemia, a colonoscopy and upper endoscopy were normal. A laparoscopic exam of the peritoneum found numerous millet-size white nodules throughout the peritoneal and liver surfaces. Biopsies confirmed the presence of necrotizing granulomatous disease. Subsequent AFB cultures were positive. Fourteen days after admission, treatment was begun with **isoniazid (INH) pyrazinamide (PZA)** and Rifampin. Because of the high prevalence of resistant tuberculosis, ethambutal was added. After another 67 days, there was marked improvement although the ascites was resolving slowly. Ethambutal and PZA were discontinued when positive AFB cultures from the peritoneum demonstrated an organism to be fully sensitive to INH and Rifampin. The patient was followed at the RISE TB clinic until March when he left for the Dominican Republic. He completed his treatment at the National TB Control Center in Santo Domingo.

Discussion

Mycobacterium tuberculosis effects 1/3 of the world's population and kills approximately 2 million individuals annually.[3,4] Because the disease can present in many different forms, in the right clinical setting the diagnosis must be kept in mind. Secondarily, delaying the diagnosis in hospitalized patients increases morbidity and mortality and exposes others to a potentially fatal disorder.[5]

In RI in 2005 there were 47 reported cases of TB and 74.5% of these were from Providence.[2] Of the 47 cases, 33 were in foreign-born patients. The site of the disease was pulmonary in 26 cases, extra pulmonary in 17 cases and both in 4 cases. Of the 19 cases confirmed by culture, 11% were resistant to one drug. Foreign-born nationals in our state make up 11.4% of the population and since, as in our case, they are more apt to be afflicted, TB must be considered in the differential diagnosis in the clinical setting.

Tuberculosis peritonitis is often diagnosed late in the course of the disease.[6] Individuals with HIV infection, cirrhosis, diabetes, malignancy and patients on peritoneal dialysis are at higher risk for TB. Peritoneal infections can occur by hematogenous spread or by direct extension from an intestinal or pelvic site. TB must be included in the differential diagnosis in patients presenting with fever, weight loss and abdominal discomfort of more than a few weeks duration.[7]

In our case the PPD was negative but this test is insensitive and, due to impaired immunity, may be negative in 40-50% of cases.[8] Although our patient had an abnormal chest CT it was not specific for tuberculosis. However, up to 50% of TB cases have negative chest radiographs.[9] A peritoneal tap was negative for cancer cells but the fluid proved to be an exudate with a high lymphocytic count, a major clue to the correct diagnosis.[10] As is typically the case, smears of the fluid were negative for acid fast bacilli. Finally, a laparoscopic exam revealed thousands of millet seed-like structures studding the

entire peritoneum and biopsies revealed caseating granulomas. TB cultures were positive after six weeks of incubation.

Although laparoscopy under general anesthesia led to the correct diagnosis, in the clinical setting of extensive ascites, a simple hook needle biopsy of the parietal peritoneum using a local anesthetic would have quickly provided an accurate diagnosis of caseating granulomas with substantial reduction of risk and a major cost savings.

Conclusions

TB is more common in foreign-born individuals and must be considered in the differential diagnosis in the right clinical setting. The lungs are often spared and the PPD is often negative. Early diagnosis and treatment is vitally important in reducing patient morbidity and mortality as well as minimizing exposure to others to this disease.

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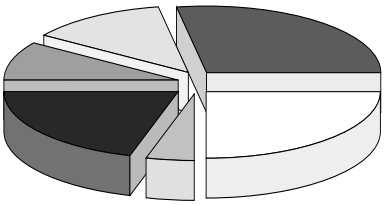

Health Insurance Update

HEALTH*pact* Plans for Small Employer: Physician's Role

Matthew Stark

HEALTH*pact* plans are now available to small employers in Rhode Island from both UnitedHealthcare of New England and Blue Cross & Blue Shield of Rhode Island. Both Blue Cross' BlueCHiP for Healthy Options and United's Pledge Plan will be effective October 1st for those enrolled by September 17, 2007.

Both United's and Blue Cross' HEALTH*pact* plans conform to criteria set forth in the Small Employer Health Insurance Availability Act and by the Wellness Advisory Committee to the Office of the Health Insurance Commissioner. Those criteria include an average individual premium of no more than 10% of the average wages in Rhode Island and plan designs that create financial incentives to reduce healthcare costs by encouraging enrollees to establish a relationship with a primary care physician, engage in healthy behaviors and actively manage chronic health conditions.

While the premium charged to all HEALTH*pact* enrollees will be based on an average monthly premium of no more than 10% of the average wages, enrollees who opt for and meet the eligibility requirements of "Advantage" level benefits will enjoy lower cost-sharing through significantly lower copays and deductibles. Advantage-level benefits are available to all HEALTH*pact* enrollees at no extra premium cost. Eligibility for Advantage-level benefits, however, requires enrollees to commit to the five HEALTH*pact* Principles, which are:

- Selecting a primary care physician,
- Completing a health risk appraisal,
- Signing a pledge to remain at healthy weight or participate in a weight management program,
- Signing a pledge to remain smoke free or to quit smoking, and
- Signing a pledge to participate in disease and case management programs if applicable.

HEALTH*pact* enrollees become eligible for Advantage-level benefits by submitting certain forms during both their first and second years of enrollment that demonstrate the enrollees' commitment to the HEALTH*pact* Principles. HEALTH*pact* enrollees who do not complete the forms will receive the "Basic" level of benefits, which do not provide the cost-sharing rewards available to enrollees eligible for Advantage-level benefits.

Of the forms required of Advantage-level enrollees, the following three are directly relevant to primary care physicians.

Primary Care Selection

This selection is part of the HEALTH*pact* enrollment process, and requires Advantage-level enrollees to designate a primary care physician. This selection is required of all Advantage-level enrollees, of any age. No interaction with a physician is necessary for enrollees to complete this requirement.

Primary Care Physician Checklist

The **Primary Care Physician Checklist (PCP Checklist)** is required for enrollees (age twelve or older) to retain Advantage level-cost-sharing in their second year of HEALTH*pact* enrollment. The PCP Checklist will be provided to a primary care physician by the enrollee, and is also available from the insurers on their websites. The Checklist must be completed and signed by the primary care physician, returned to the enrollee, and forwarded to the insurer by the enrollee no later than eight months after enrollment. Completion of the PCP Checklist involves a visit with the primary care physician and requires information on the enrollee's **Body Mass Index (BMI)** and smoking status. If the enrollee's BMI is above the recommended range, or if the enrollee is a smoker, the completed PCP Checklist must (1) show that the primary care physician has discussed weight loss and/or smoking cessation programs with the enrollee and (2) describe the enrollee's program goals. There are no restrictions as to what programs can be used to achieve an acceptable BMI or non-smoking status. Enrollees and primary care providers should discuss options and select a best fit for the enrollee.

Physicians will not be responsible for forwarding the Checklist to the insurer or ensuring that enrollees submit the Checklist to the insurer within establish timeframes.

Commitment to Participation in Wellness Programs

Enrollees (age eighteen or older) must also pledge to participate in the weight loss and/or smoking cessation programs in order to retain Advantage level-cost-sharing in their second year of HEALTH*pact* enrollment. This pledge is intended to confirm enrollee commitment to smoking cessation or weight loss as recommended in the PCP Checklist. Enrollees are required to note their smoking and weight status and actions taken towards participation in wellness programs for weight and smoking. No interaction with a physician is necessary for enrollees to complete this requirement.

Stemming the erosion of employer-based health insurance coverage in Rhode Island is critical to maintaining the integrity of the private health insurance market in this state. To the small employer, HEALTH*pact* plans are a step in that direction.

For more information about the HEALTH*pact* plans, other regulatory developments and current information about the efforts of the OHIC to ensure the fair treatment of the state's health care providers, please visit: www.dbr.state.ri.us/divisions/healthinsurance. For samples of the above-mentioned forms, contact Blue Cross & Blue Shield of Rhode Island or UnitedHealthcare of New England.

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Disclosure of Financial Interest

The author has no financial interests to disclose.

Information for Contributors

Medicine & Health/Rhode Island

Medicine & Health/Rhode Island is a peer-reviewed publication, listed in the *Index Medicus*. We welcome submissions in the following categories.

Contributions

Contributions report on an issue of interest to clinicians in Rhode Island: new research, treatment options, collaborative interventions, review of controversies. Maximum length: 2500 words. Maximum number of references: 15. Tables, charts and figures should be camera-ready, or as separate files (jpg, tif, pdf). Photographs should be saved as separate files. Powerpoint files and slides are not accepted.

Creative Clinician

Clinicians are invited to describe cases that defy textbook analysis. Maximum length: 1200 words. Maximum number of references: 6. Photographs, charts and figures may accompany the case.

Point of View

Readers share their perspective on any issue facing clinicians (e.g., ethics, health care policy, relationships with patients). Maximum length: 1200 words.

Advances in Pharmacology

Authors discuss new treatments. Maximum length: 1200 words.

Advances in Laboratory Medicine

Authors discuss a new laboratory technique. Maximum length: 1200 words.

For the above articles: Please submit 4 hard copies and an electronic version (Microsoft Word or Text) with the author's name, mailing address, phone, fax, e-mail address, and clinical and/or academic positions to the managing editor, Joan Retsinas, PhD, 344 Taber Avenue, Providence, RI 02906. phone: (401) 272-0422; fax: (401) 272-4946; e-mail: retsinas@verizon.net

Images in Medicine

We encourage submissions from all medical disciplines. Image(s) should capture the essence of how a diagnosis is established, and include a brief discussion of the disease process. Maximum length: 250 words. The submission should include one reference. Please submit the manuscript and one or two clearly labelled cropped files with the author's name, degree, institution and e-mail address to: John Pezzullo, MD, Department of Radiology, Rhode Island Hospital, 593 Eddy St., Providence, RI 02903. Please send an electronic version of the text and image to: JPezzullo@lifespan.org.

Financial Disclosure Forms

All authors must submit a financial disclosure statement of possible conflicts. The form is available from the managing editor, or the Rhode Island Medical Society web-site (www.rimed.org).

Refugee Health Update: Lead Exposure in Refugee Children

María-Luisa Vallejo, MA, MEd, MPH, Carrie Bridges, MPH, Magaly Angeloni, MBA, and Peter R. Simon, MD, MPH

Although there have been dramatic reductions in blood lead levels (BLLs) among children in the United States and Rhode Island in recent years, childhood lead poisoning remains a significant public health concern. In Rhode Island, among children entering kindergarten in the fall of 2006, 8% had been found to have elevated BLLs at some time prior to age three.[1] Among children living in the state's core cities (Central Falls, Newport, Pawtucket, Providence, West Warwick, and Woonsocket), the prevalence rate was 13% of children.[1]

Over the last decade, an average of 70,000 refugees per year have resettled in the US, with the proportion of children ranging between 30% and 40%. During a recent 21-month period, the majority of the 352 refugees arriving in Rhode Island came from Sub-Saharan Africa, most notably Liberia, Ivory Coast, Ethiopia, and Somalia.[2] Large proportions of children arriving from those countries have been afflicted by iron deficiency and chronic and acute malnutrition that put them at high risk for lead poisoning. Accordingly, the refugee health screening in Rhode Island, which is required for all refugees within 30 days of arrival, includes a BLL test among children up to age 6.[3] Children with a BLL test result of 10 µg/dL or greater are classified as having elevated blood lead levels, and children who have a single venous BLL test result of 20 µg/dL or greater or two tests (capillary or venous) occurring at least 90 days apart but no more than 365 days apart with levels of 15 µg/dL or greater are classified as "significantly lead poisoned."[1] For children in the latter category, the Department of Health offers a home inspection by certified lead inspectors to determine whether lead hazards are present and to work with property owners to mitigate any hazards identified.

Epidemiological Findings in New England States

Several studies in New England states show the prevalence of lead poisoning and associated risk factors among refugee children. Among Somali-Bantu children ages 0-14 years arriving in Massachusetts between April 2003 and September 2005, 182 of 290 (63%) were found to be anemic. Among those under age 12, 21% (33 of 157) had elevated BLLs, with 6 of those (4%) having levels of 20 µg/dL or greater. More recently (April 2005-March 2006), among arrivals from all African nations, 26 of 193 (14%) of children were found to have elevated BLLs, with especially high prevalence rates among Somali (28%) and Liberian (28%) children.[4]

Another study, conducted by the New Hampshire Department of Health and Human Services, examined BLL test results for 242 refugee children (ages 6 months – 15 years) arriving in the state during the period October 2003-September 2004, primarily from Africa (238) and primarily resettling in the city of Manchester (216). Of the 242 children, 210 were tested for blood lead within 90 days of their arrival and 92 of them were tested again between 3 and 6 months after their initial test.[5] Among the children who were tested twice, 11% had elevated BLLs at the time of initial screening only, 14% had elevated levels at both initial and follow-up screening, 29% had elevated levels at the follow-up screening only, and 46% had no findings of elevated blood lead. Thus, many children had elevated BLLs when they arrived in the US, presumably from exposures in their home countries, and an even greater number were found to have acquired elevated levels from exposures after their arrival here.

Although data on BLLs specific to refugees arriving in Rhode Island are not available, the results from Massachusetts and New Hampshire can be presumed to extend to them, as there is substantial overlap in the countries of origin. Many of these children will arrive with elevated BLLs, and many more will arrive with risk factors for acquiring elevated levels.

Centers for Disease Control and Prevention (CDC) Recommendations

The CDC has developed recommendations for testing, treating, and preventing lead poisoning among refugee children: [6]

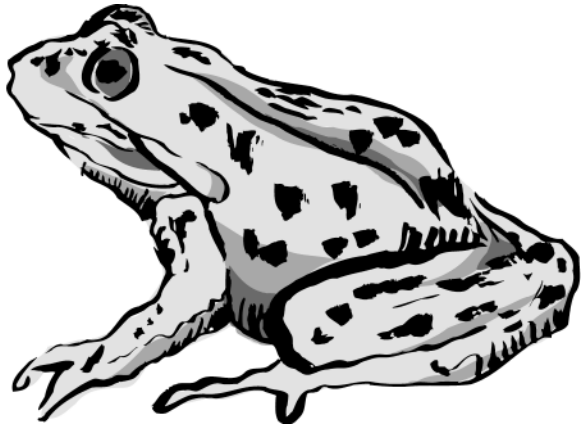
- Identification of Children with Elevated Blood Lead Levels
  - Blood lead level testing of all refugee children 6 months to 16 years old at entry to the US.
  - Repeat blood lead level testing of all refugee children 6 months to 6 years old (and older children, if warranted) 3 to 6 months after refugee children are placed in permanent residences, regardless of initial test results.
- Early Post-arrival Evaluation and Therapy
  - Upon US arrival, all refugee children should have nutritional evaluations performed, and should be provided with appropriate nutritional and vitamin supplements as indicated.
  - Evaluate the value of iron supplementation among refugee children.
- Health Education / Outreach
  - CDC and its state and local partners should develop health education and outreach activities that are culturally appropriate and sensitive to the target population.
  - CDC and its state and local partners should develop training and education modules for health care providers, refugee and resettlement case workers, and partner agencies (e.g., WIC) on the following:
    - Effects of lead poisoning among children.
    - Lead sources in children's environments and ways to reduce the risk of exposure.

– Nutritional and developmental interventions that can mitigate the effects of lead exposure.
– Ways to provide comprehensive services to children with elevated blood lead levels.

A New Research Study

Under the leadership of Paul Geltman, MD, MPH, of the Massachusetts Department of Public Health, a retrospective cohort study to examine the relationship between BLL, behavioral practices, and world region of origin in refugee children has been developed.[7] This study addresses the relative lack of data on the subject during the past five years, a period when the demographics of the refugee population entering the United States have been changing.

This research is designed to contribute to the overarching goal of describing the distribution of lead exposure in refugee children resettled throughout the US. There will be a focus on refugees from Africa, who have accounted for a large proportion of incoming refugees in recent years, as well as on identifying the cultural and behavioral practices that can influence the risk of lead exposure. Participating states and localities will be asked to identify a sample of 30 refugees from their jurisdictions to be included in the study so that it will represent the situation of refugee children nationally.



Conclusion

In Rhode Island, the Refugee Health and the Childhood Lead Poisoning Prevention Programs have put in place a system to ensure that refugees are screened for lead upon their arrival to the United States. Some refugees have already been exposed to lead sources in their own countries, but some others are potentially exposed to lead once they are here. While lead screening is a test that verifies the presence of lead in a child's blood stream, what is really important is to eliminate the sources that cause lead poisoning in young children. The key is to conduct primary prevention, so no child is exposed to lead and its deleterious effects. Strategies to permanently remove lead hazards from homes and provide healthy housing to families, along with resources to implement them, must be put in place and be continuously supported.

For additional information on lead and lead poisoning, visit the Rhode Island Department of Health's web site, www.health.ri.gov/lead.

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3. Refugee Health Program website. Rhode Island Department of Health. http://www.health.ri.gov/chew/refugee/index.php.
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6. Centers for Disease Control and Prevention. *Recommendations for Lead Poisoning Prevention in Newly Arrived Refugee Children.* http://www.cdc.gov/nceh/lead/refugee%20recs.htm.
7. Geltman PL. *Lead Exposure in Refugee Children in the US: Research Plan*. Boston, MA: Massachusetts Department of Public Health. January 2006.

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Disclosure of Financial Interests

The authors have no financial interests to disclose.

Letters

To The Editor:

It was with a mixture of bemusement and horror that I noted the recent requirements under the author byline disclosing any financial interests. I have somewhat gotten used to the preamble of this litany at most lectures and I suppose on the surface this is a good thing. However, it occurs to me that a wide variety of other disclaimers should be made simultaneously. Humans, and physicians are no exception, are inherently subject to all sorts of bias, financial entanglements being only one. I think we are simply fooling ourselves if we think that the unvarnished truth is going to come forward simply by disclosing that one is a consultant to X pharmaceutical company. Other issues such as research interests, grant applications, a whole host of academic pursuits and simply anecdotal experience all influence the opinions given to us by our lectures and writers. Perhaps we should have extensive lists of disclaimers in which you list the biotech, pharmaceutical and medical facility stock holdings of your brother-in-law. While we're at it we can put down the anecdotal reports of success for your barber's hair-loss treatment.

We have heard repeatedly about reports of willful misleading but these among most medical colleagues are the rare exception rather than the rule. Most of us try to communicate in good faith what we believe to be true. Favoritism is a natural human inclination and declaring that it is so in public does not eradicate that fact or abrogate our responsibilities to sift through available opinion with a modicum of perspicacity. The simple fact is that we cannot indemnify information gathers and disseminators from prejudice. It simply boils down to the fact that intelligent people are required to take everything with a grain of salt and look at the science and demonstrated proof behind the contentions of any opinion.

To me the listing of potential conflicts of interest is just one more "feel good" attempt to demonstrate our honesty. It is ridiculously ineffective and we are fooling ourselves if we believe that it is providing any significant benefit in rooting out bias.

Sincerely,
Stephen E. Glinick, MD

Editor's response:

I agree with Dr Glinick's sentiments, and have written a few times on the lack of correlation between mandated ethics, which often translates into filling out forms while not enhancing ethical activities, and truly ethical actions, which are often not captured in "the paper trail." I also agree that one wonders where to draw the line in establishing a conflict. In most conflict of interest forms the declarations extend to spouse and children in terms of others' involvement, but sometimes also list a certain sum of money as a threshold. For example, I was excluded from writing an invited editorial because I had received more than a certain amount of money from a company whose drug would be discussed in the article.

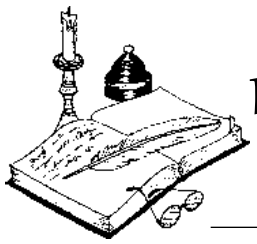
Nevertheless I am convinced he is wrong about his suggestion that the journal not require conflict of interest statements. Medicine has changed so dramatically over the past two decades that it is difficult to find physicians without ties to industry to give talks or to write papers. It is helpful for the reader, especially the more skeptical ones, who may say, "Boy, this sounds biased," to then learn that the author is, in fact, tied to an involved company. That does not undercut what the doctor writes/says, but it certainly should make the reader/listener more vigilant.

We are all biased. My experience is different than yours. My last three cases were different than yours. Data is data, but how it is arrived at, how it is interpreted are all subject to bias, conscious or unconscious. The reader should be the judge, not the writer.

Nakedness may be next to godliness.

PS. I am now grappling with the fact that I am a consultant to two large law firms representing pharmaceutical companies in law suits related to my neurological subspecialty. I have not seen any journal publish authors' legal connections, but these should bear the same weight as consulting for the drug companies directly. Of course, the lawyers contacted me because of my publications. But how will that influence my future publications? Who knows? But wouldn't it be better if you, the reader, knows of the connection?

Joseph H. Friedman, MD



Physician's Lexicon

The French Connection

Most medical terms are derived from Greek and Latin with a substantial aliquot from Anglo-Saxon sources. The medical vocabulary of most Western European nations is similarly comprised of Greco-Latin terms plus a handful of vernacular words. Many of our clinical and laboratory terms, in addition, are taken from the French medical vocabulary; and while most of these words had their roots in the Classical languages, they have taken on a distinctly Gallic flavor and texture before their adoption by the English and Americans.

Consider how many and varied medical phrases, from current French, color medicine's technical conversation: ***café-au-lait*** [coffee-colored], ***forme fruste*** [an abortive form], ***cul-de-sac*** [a dead-end alley], ***grand mal*** [major seizure], ***petit mal*** [small seizure], ***folie a deux*** [insanity of two], ***idiot-savant*** [a great cognitive skill, narrowly defined, in an otherwise mentally challenged human], ***tic douloureux*** [a painful, usually trigeminal, neuralgia]. ***Mal de mer*** [sea-sickness; no French phrase, though, for car-sickness] and, of course, ***déjà vu***.

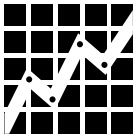
Laennec and his many contributions to the clinical examination of the thorax heralded the many French terms pertaining to the chest. A ***rale***, originally meaning a death-rattle, has assumed a less lethal meaning when it now defines certain abnormal breath sounds heard through the stethoscope. A ***bruit***, from a French word meaning a rustling noise, now describes a wide variety of auscultatory sounds mainly of the pathologic variety [eg, ***bruit de soufflet***, the sound of a blowing murmur.] The word, murmur, is also of French origin and is an imitative, reduplicative neologism attempting to imitate soft sounds or auscultatory rubs.

Numerous surgical instruments carry French names: curette [from the French, ***curer***, meaning to cleanse], rongeur [from the French, ***ronger***, to gnaw], trocar [from the French, ***trios carres***, three edges] and lancet [from the French meaning little spear.]

A mélange of French words have infiltrated the English medical vocabulary: lavage [to wash or rinse], lozenge [originally defining a four-sided figure such as a rhomboid pill, but originally from the Latin, to praise], massage [a French term derived from an Arabic word meaning 'he was touched'], tampon [from the French, ***tapon,*** a plug to stop bleeding], tourniquet [from the French, 'to tighten' but also the basis for the word, tunic] and morgue [originally a French word meaning haughty. It was first used to define the admitting room of police stations – where, presumably, detainees were haughtily examined; the word was then applied to the entrance chamber of cemeteries and eventually, to rooms that stored cadavers.]

Finally, a further scattering of French words readily accepted in English includes chancre, grippe, calorie and debridement.

– **Stanley M. Aronson, MD**



Rhode Island Department of Health
David Gifford, MD, MPH
Director of Health

Vital Statistics

Edited by Colleen Fontana, State Registrar

Rhode Island Monthly Vital Statistics Report Provisional Occurrence Data from the Division of Vital Records

Underlying Cause of Death	Reporting Period			
	November 2006	12 Months Ending with November 2006		
	Number (a)	Number (a)	Rates (b)	YPLL (c)
Diseases of the Heart	225	2,703	252.7	2,997.0
Malignant Neoplasms	177	2,316	216.5	6,222.5
Cerebrovascular Diseases	25	384	35.9	432.5
Injuries (Accidents/Suicide/Homicde)	41	481	45.0	7,184.0
COPD	39	482	45.1	427.5

Vital Events	Reporting Period		
	May 2007	12 Months Ending with May 2007	
	Number	Number	Rates
Live Births	1,041	13,652	12.8*
Deaths	840	9,991	9.4*
Infant Deaths	(7)	(96)	7.0#
Neonatal Deaths	(6)	(65)	4.8#
Marriages	526	6,828	6.4*
Divorces	276	3,110	2.9*
Induced Terminations	376	4,738	347.1#
Spontaneous Fetal Deaths	71	966	70.8#
Under 20 weeks gestation	(65)	(895)	65.6#
20+ weeks gestation	(6)	(71)	5.2#

(a) Cause of death statistics were derived from the underlying cause of death reported by physicians on death certificates.

(b) Rates per 100,000 estimated population of 1,067,610

(c) Years of Potential Life Lost (YPLL)

Note: *Totals represent vital events which occurred in Rhode Island for the reporting periods listed above. Monthly provisional totals should be analyzed with caution because the numbers may be small and subject to seasonal variation.*

* Rates per 1,000 estimated population

\# Rates per 1,000 live births

MEDICAL MALPRACTICE TOPICS

INFORMATION FOR RHODE ISLAND PHYSICIANS FROM BABCOCK & HELLIWELL

PERSONNEL FILES:
Sound Risk Management Practices

John Tickner, CPCU, President, Babcock & Helliwell

Both the federal government and the state of Rhode Island have stringent regulations covering employee personnel records. As an employer, you must ensure that your record-keeping policies comply with these regulations.

Setting Policy

Your practice should have a formal written policy on what specific employee records will be kept, for how long, where the records will physically be housed, and who will have access and to what information.

It is good practice to periodically review files to correct, or in some cases even remove, outdated, inaccurate, or irrelevant information. Your practice's policy should include a timetable that indicates when records will be reviewed.

Personnel Files

One of the common mistakes employers make is to keep all of an employee's records in the same file. A "personnel file" should not be a catchall for other information that you have pertaining to an employee.

The basic personnel file should only include: (1) an employment application and the employee's resume, (2) documentation relating to hiring, promotions, transfers, change in pay, etc., (3) performance appraisals, and (4) disciplinary actions and termination records.

This information is helpful for employers, your HR staff, and the employee's direct supervisor. Any documents that identify the employee's race or sex should be kept separate and restricted to those with HR responsibilities. This is to minimize any possible claim of discrimination.

Under Rhode Island law, 28-6.4-1, employees have the right to inspect (but not copy) their personnel file up to three times per year. You can require that such requests be made in writing, and that the review be done at your location, but outside work hours.

Employment Eligibility Verification Form (I-9)

The medical field attracts many workers from other countries. As an employer, the federal government requires you to verify that you are hiring only persons who may legally work in this country. The March, 2007 INS raid at Michael Bianco Inc. in New Bedford, MA, brought home the importance of verifying the work status of employees. You should:

- Require all employees fill out a Form I-9, when hired;
- Review all documents provided by an employee that establish his or her identity and eligibility to work;
- Complete Form I-9 and place it in the personnel file;
- Make Form I-9 available for inspection to an appropriate government officer upon request.

Medical Records

If you provide any medical treatment to an employee (and many experts strongly recommend that you not medically treat employees, except in an emergency situation) you must keep such medical records separate from personnel records. Access to this file should be heavily restricted. The only time a non-HR supervisor should be privy to this information is when he or she is setting up a reasonable accommodation.

Retention

The U.S. Office of Management and Budget recommends that most records be retained for six years after termination, resignation, or retirement (I-9 forms must be retained for three years after hire or for one year after termination, whichever is later). Records on non-hired applications should be retained for three years.

Stay Informed

For more information on this subject, go to www.dol.gov.

***John Tickner**, CPCU, is president of Babcock & Helliwell, a privately held independent insurance agency established in 1892 that provides professional insurance-related services of all kinds. Babcock & Helliwell is an agency for ProMutual Group, New England's largest medical malpractice insurance provider and the second-largest provider in Rhode Island. The views expressed are solely those of John Tickner, CPCU, and Babcock & Helliwell.*

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Ninety Years Ago, November 1917

Roland Hammond, MD, in "The Stiff and Painful Shoulder," traced the cause either to injuries, such as dislocations, or diseases, such as subachromial bursa, arthritis, and tuberculosis.

Charles A. McDonald, MD, in "Some Remarks on Exophthalmic Goitre," discussed the symptoms for 6 of 15 of his cases. The symptoms included hyperthyroidism and blood pressure.

Delos J. Bristol, Jr, MD, in "The Percy Operation," praised this…" method of applying heat both to inhibit and destroy inoperable carcinoma of the uterus and vagina," developed in 1912 by Dr. F. Percy of Galesburg, Illinois. Dr. Bristol suggested: "In obese women it offers the only chance for a permanent cure."

During World War I, Rhode Island's hospitals and clinics were under-staffed. An Editorial, "The Civil Clinic in War Time," called on physicians in Rhode Island to fill the gap left by physicians serving overseas. "Inasmuch as it is the American people and not merely the American armed forces that are at war with Germany, the obligation for service is universal…" "..every physician who is in practice should be ashamed not to be on duty in at least one public clinic every day throughout the period of the war."

Fifty Years Ago, November 1957

A.A. Savastano, MD, in "Recurrence of Convulsive Seizures Complicating Steroid Therapy." discussed two patients who developed seizures after receiving meticorden. One patient, who had epilepsy, had been seizure-free for the previous 10 years; the second patient developed seizures after an operation for a brain tumor.

Alfred F. Tetreault, MD, in "Merits of 2-hour Post-Prandial Blood Sugar Screening Test," reported that he found it "more sensitive and reliable than a fasting blood sugar."

Seebert J. Goldowsky, MD, discussed "The First Appendectomy in Rhode Island." Nationally, the first successful appendectomy was probably performed by Thomas G. Morton, MD, Philadelphia, in 1887. In 1882 Robert Noyes, of Providence, read a paper before the RI Medical Society. He had collected from the literature and from his own experience 100 cases of perityphlitic abscess treated by surgical drainage (mortality was 15%). In February 6, 1893, Dr. George L. Collins, of Providence, performed the first appendectomy. The patient recovered.

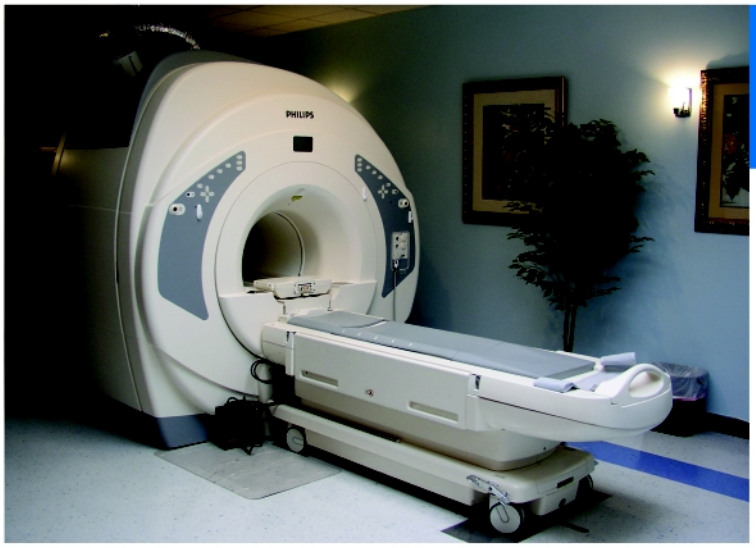
Twenty-Five Years Ago, November 1982

Glenn W. Mitchell, MD, in "Emergency Medical Technicians in RI: An Overview," noted "Support and involvement of physicians is necessary for the design and implementation of a paramedic program."

Alex M. Burgess, Jr, MD, and William H. Meroney, MD, discussing "Health Maintenance," noted "Certain fallacies in the conventional wisdom regarding nutrition and lifestyle."

Gerald A.Faich, MD, MPH, and Robert Mullan, MD, contributed "Hospitalization for Tuberculosis." "The hospital stay is prolonged by the delay in …the diagnosis and non-tuberculosis problems." Of 107 cases discharged throughout one year, 57 had a primary diagnosis of TB; 50 had a secondary diagnosis. Most (87%) of newly diagnosed patients were hospitalized in 1979.

The Name of Choice in MRI



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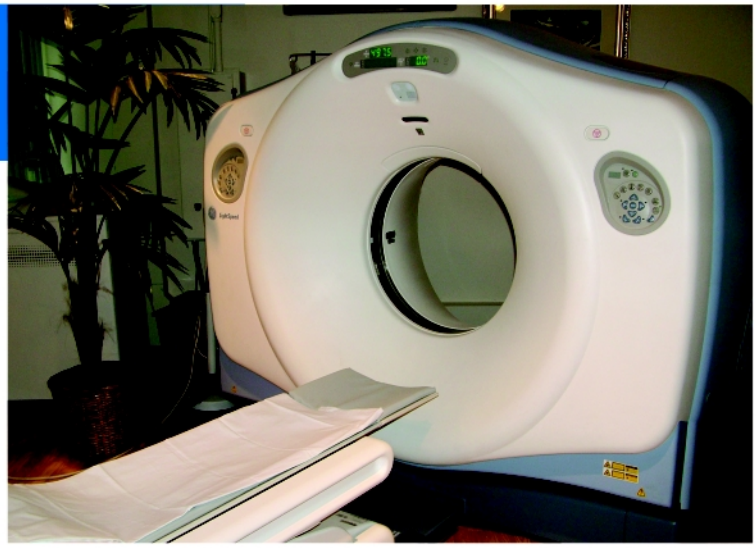

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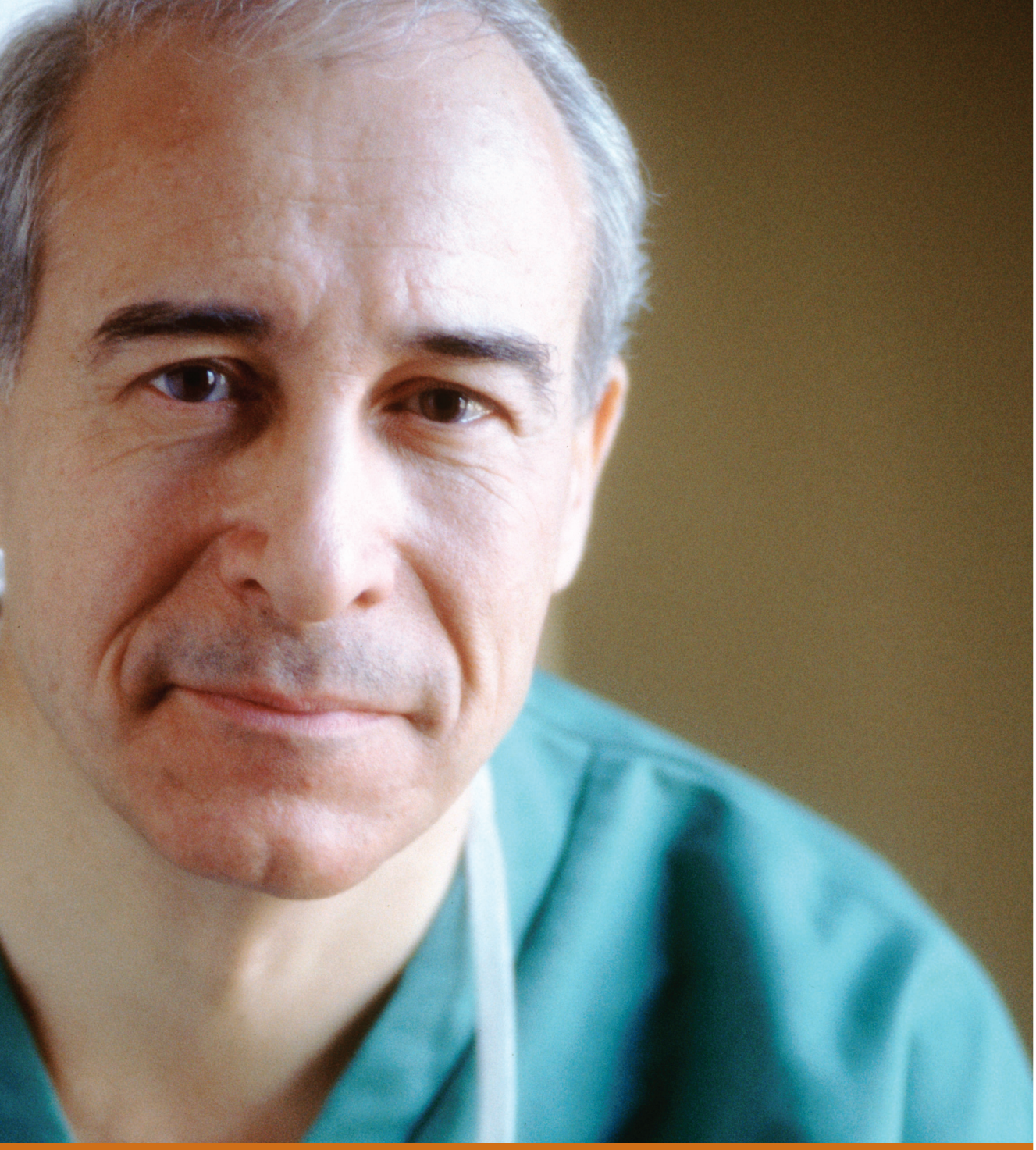
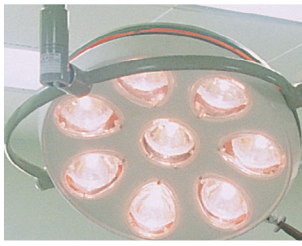
integrity





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