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Medicine & Health RHODE ISLAND

Publication of the Rhode Island Medical Society

HIV

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COMMENTARIES

CONTRIBUTIONS

SPECIAL ISSUE: HIV
Guest Editors: Charles C.J. Carpenter, MD, and Erna Milunka Kojik, MD

COLUMNS

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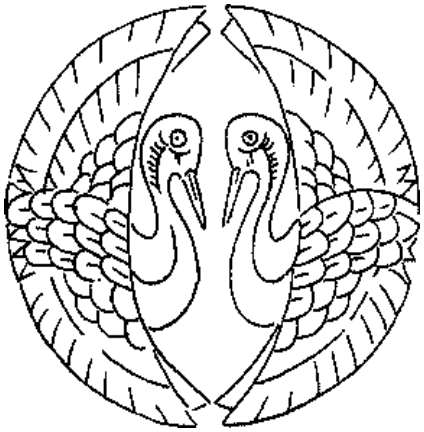
Commentaries

Political Correctness Is Unethical



I proposed a study to a national research group I belong to. I wished to collect reports from the study group members (doctors, nurses and associated personnel), on their Parkinson's patients' most interesting and educational descriptions of hallucinations, delusions and compulsions. These are quite fascinating to medical and non-medical people, particularly to people with personal experience with PD, both patients and subjects. They also help us to understand and care for patients. Finally, the reports provide opportunities for learning about the biochemistry or pharmacology of these phenomena.

So I asked to be allowed to send out an e-mail solicitation asking for these vignettes. My goal, stated in the mailing, was to compile the most illustrative and interesting reports, and publish them in both a medical journal and in the PD lay organization press. My research group agreed, but one administrator wisely asked if I had obtained **Institutional Review Board** (**IRB**) approval. Without it, she opined, the report may not be publishable. I was dumbstruck. Why didn't I think of something so ridiculous? Actually I thought that if the vignettes were not identified with the contributor, there would be no way to connect an anecdote with a location, let alone an individual, so that privacy could not possibly be an issue.

I contacted the editor of one of the journals I thought I might submit this article to and learned that the journal would indeed require an IRB approved exemption. That is, the journal would require an IRB to officially review my proposal and attest, in writing, that I did not need to obtain written informed consent to ask for this information.

I am not sure who would issue the consent if it was required. The patient or the informant? How this private health information could conceivably threaten the privacy of any individual is beyond me.

I am reminded of an issue of the *New England Journal of Medicine* many years ago when a case report was published and the person who was the subject of this anonymous report published a letter to the editor in the journal complaining about his privacy being violated, not noticing that his letter was the communication which unmasked his anonymity. Since the report came from Michigan, not a small place like Rhode Island where an unusual illness might be a source for identification, this made little sense, although one can argue that cases so unusual as to merit publication in the *New England Journal* may, in fact, allow easy identification.

In the case of journals, I think this type of policy is a disservice. It avoids taking responsibility for projects which are clearly ethical, and makes the pursuit of medical knowledge an almost adversarial enterprise, as if any project, no matter how removed from identifiable information, is a potential violation of HIPAA. It is a policy that extends our unmatched fervor for pursuing and defending against litigation to the research field.

If I think that a medicine causes a particular side effect I am bound to ask about it. Not to ask about it would constitute a form of malpractice. If, on the other hand, I wish to prove that this association is real, and keep track of how many of my patients who take this medication experience this side effect, I would not be able to publish the result in many national journals without getting approval from an IRB, an enterprise that takes both time and money. This is not simply silly, as in the true example I began this article with. It is unethical. It is malpractice to the larger community. Yet no one, so far as I am aware, has complained about it.

Medical journals belong to the medical societies they emanate from, or to the publishing houses which eke out their tiny profits. It is up to the readers of the latter journals and the members of the societies to try to take back the journals from their mindless insistence on political correctness in the form of a mistaken belief that IRBs must provide an ethical seal of approval for any project. The only reason to think that an IRB provides any higher degree of ethical scrutiny than a journal's board of editors is that the lay public and religious organizations often have representatives on IRB panels. While these non-specialists provide a different point of view, there is little reason to think these views are required in many cases.

I propose that all medical journals only require IRB approval when there are privacy or ethical considerations. The reader will think this is obvious and merely constitutes common sense, because it does. Unfortunately, this is a dose of medicine that our academic journals appear to need.

– Joseph H. Friedman, MD

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He Leadeth Me Beside the Still Waters

Life on this planet began in the seas some three to four billion years ago. And despite the numberless life-forms that have since become irreversibly terrestrial, the bulk of the world's flora and fauna have remained resolutely marine.

Freedom from an aqueous environment, even for land-adapted creatures, however, is an illusion. In an operational sense, the land-based creatures never really abandoned the wine-dark, saline-tinged seas. Through evolutionary adaptation, our primordial ancestors carried a bit of the seas within themselves, internalizing the salt-flavored seas as their internal fluids circulated within ramifying conduits called blood vessels while bathing their internal organs in an ambience of water and salts astonishingly similar to the chemical composition of the seas.

It is an illusion, and a desperate one, to think therefore that man can overcome his remote marine heredity. As humans, we begin our land-based life bathed, protected and nurtured by our mother's amniotic fluids. Water sanctifies, or otherwise welcomes, the newborn into a world of increasing complexity and hazard; and we are then sustained throughout extra-uterine existence by an abundance of water at all stages of our lives. Indeed, humans cannot survive more than a handful of days without water. We recognize, subconsciously, the centrality of water in our lives as its mere presence calms us whether it be flowing, falling or springing forth as fountains. The primacy and essentiality of water has been recognized in all religions; and water, whether plain, fermented, holy or baptismal, has been incorporated into the crucial rituals and dogmas of most faiths.

Water, carbonated or tinged with alcohol, even christens our newly constructed ships before they are launched into the beckoning sea waters. Water graces the dinner table whether in Sante Fe, Santiago or the Sahara. Water sustains the vast agricultural enterprise on all of the continents, and ready access to water for irrigation, and through rainfall, is the principal determinant of whether a nation generates its own food supply or, alternatively, depends upon other countries to provide its nourishment.

Water cleans our environment as well as our bodies. Water therefore sustains us; and yet sadly, sometimes, betrays us. In its ubiquity, water also serves to convey pathogens from one person to another providing the conduit by which such devastating infections as typhoid fever, cholera, dysentery and the numberless diarrheas of infancy and childhood burden the lives of humans. Epidemiologists estimate that over one-third of all mortal infections are water-borne.

One of the great problems facing humanity is the increasing shortage of potable water for its six billion inhabitants. Certainly there is no dearth of water since the amount of water on or beneath the global surface, in contrast to our finite and diminishing sources of energy, has not varied in billions of years. But of this vast quantity, 97% is salt water; and 2% of the remaining 3% is bound in ice. Furthermore, the vast quantities of fresh water beneath the earth's surface are too deeply situated to make recovery economically feasible.

There is an enormous difference in the volume of water employed by citizens in different nations. Americans on average use 1,300 gallons of potable water per day. In Europe, the amount diminishes to about 400 gallons daily; and in rural Africa, the volume rarely exceeds 4 gallons per day per person. These huge differences demand an explanation: In the United States 98% of homes had readily available interior access to clean water, including the luxury of flush toilets (which use about 3.4 gallons per flush). But certainly, even with badly leaking plumbing, the use of 1,200 gallons per day seems obscenely excessive. The United States extracts 350 billion gallons of water per day, either through wells or from surface sources. This immense volume, when divided evenly amongst the nation's population of about 300 million thus allegedly yields 1,200 gallons for each person. But this is a deceptive figure since 78% of water goes solely for irrigation purposes, leaving only 22% to be divided between burgeoning industrial needs, personal hygienic wants, culinary requirements and certain uniquely American functions. Visitors from tropical lands are often rendered speechless when they see how Americans use vast quantities of water – potable water, no less – to water their lawns, wash their vehicles and wash their streets.

Water is life; solely by its grace do we live. Where there is no water, there is no life. And these verities are fully substantiated in any convenience store which sells both gasoline for our automobiles and essentials for our households. In the last year gasoline has varied from about $2.00 to slightly over $4.00 per gallon (hence about 38 cents per pint.) The same store will happily sell you a pint container of water, whatever brand, for about 90 cents per pint bottle. Basic marketplace arithmetic tells us, therefore, that water is twice as valuable as gasoline.

– Stanley M. Aronson, MD

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Introduction: HIV

Charles CJ Carpenter, MD, and Erna Milunka Kojic, MD

The Immunology Center was established at The Miriam Hospital in 1987, and has provided comprehensive care for a progressively increasing proportion of Rhode Islanders living with HIV since that time. The development of the Immunology Center has enjoyed strong continuing support of the broad Rhode Island community, including federal, state and local legislators, the Miriam Hospital Trustees, the Lifespan Administration, Brown University and the Rhode Island AIDS Services organizations. Their support has been both critical and substantial.

This issue of *Medicine & Health/Rhode Island* provides an overall summary of the patient care programs, with a more detailed description of several areas in which the Brown University faculty have been playing leading roles in clinical research on the national scene. These include:

1. The comprehensive care of women living with HIV, including establishment of the nation's first Menopause Clinic, devoted exclusively to women with HIV infection.

2. An exceptionally effective program, through the Women and Infants Hospital of Rhode Island, for the management of pregnancies in women living with HIV.

3. A regularly scheduled Bone Clinic, devoted exclusively to the problem of osteopenia and osteoporosis in persons living with HIV.

4. One of several nationally recognized Co-infection Clinics devoted to the management of persons living with combined HIV and Hepatitis B and C co-infections, one of the most challenging problems in contemporary medicine.

5. The comprehensive long-term management of incarcerated persons living with, or at risk for, HIV infection. This program, in which Brown University students as well as resident physicians and faculty participate, has been recognized as the national leader in this critical field.

6. Close participation with the Rhode Island Department of Health in an effort to broaden the scope of routine opt-out HIV testing, with the aim of reducing the relatively large number of persons, especially women, who are unaware of their HIV infection until irreversible complications have occurred.

The following articles highlight important components of the Immunology Center program.

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Special Care Issues of Women Living with HIV/AIDS

Erna Milunka Kojic, MD, Chia Ching Wang, MD, Jacqueline A Firth, MD, Geetha Gopalakrishnan, MD, Susan Cu-Uvin, MD

Globally over half of adults living with HIV or AIDS are women.[1] In the United States, more than one quarter of all new HIV and AIDS diagnoses are women, and about a third of people living with HIV or AIDS are women.[2] In Rhode Island in 2006, 25% of persons living with HIV were women. Most Rhode Island women living with, or at risk for, HIV infection, do not themselves have high-risk sexual behaviors, but are vulnerable because of the past or present risk behavior of their partners, as roughly 90% of the HIV transmission to women occurs via heterosexual sex. African American and Hispanic women in Rhode Island are especially vulnerable to HIV: they represent only 14% of Rhode Island's female population, but 73% of new HIV cases among women between 2000 and 2006.[3] Health care providers should be aware of the special care needs of women living with HIV.

HIV and Pregnancy

HIV can be transmitted antepartum, intrapartum, and postpartum. About two thirds to three quarters of mother-to-child transmissions occur during or close to the intrapartum period.[7] Without combination ART, vertical transmission ratios range from 25-35%. With the advent of **highly active antiretroviral therapy** (**HAART**), vertical transmission rates in the United States have dropped to 1-2%. The most important determinant of mother-to-child transmission is the maternal plasma HIV load, but other factors, including low CD4 count, poor maternal nutrition, concomitant sexually transmitted diseases,[8-11] prolonged rupture of membranes, invasive fetal monitoring, chorioamnionitis,[10,12] and prematurity, also contribute to perinatal HIV transmission.[13,14]

Women of child bearing age with known HIV seropositivity are choosing to become pregnant in small but ever increasing numbers, as the risk of transmitting HIV to their children becomes statistically less. Between 1982 and 2006, 24 children in Rhode Island contracted HIV via mother-to-child transmission. With the administration of HAART to all pregnant HIV-infected women as recommended by most experts, only 3 cases of documented mother-to-child HIV transmission occurred in Rhode Island in the last 5 years; in none of these cases had the mother received the recommended antenatal treatment.

Unfortunately, there are still many women in Rhode Island who are diagnosed with HIV only during pregnancy. State laws have recently required "opt out" testing of the mother during pregnancy, meaning that HIV testing is part of routine prenatal testing unless the patient declines. After the state changed from "opt-in" to "opt-out" HIV testing, the rate of HIV testing of pregnant women increased from 53% to 93%. In addition, protocols are being put in place at Women & Infants' Hospital, the busiest delivery center in the state, to require HIV testing of the baby immediately after birth if there is no documented HIV test for the mother. The goal is always to have 0% transmission in order to limit the epidemic to the current generation. Information on the Rhode Island state law regarding testing of pregnant women for HIV is available at http://www.rilin.state.ri.us/BillText/BillText07/SenateText07/S0841Aaa.htm

HIV and Human Papillomavirus

Over 100 types of the DNA **Human papilloma virus** (**HPV**) have been identified. Between 30-40 types are sexually transmitted and infect the genital area of both men and women. Cervical HPV infections are more prevalent and persistent in HIV- infected women, particularly among women with a lower CD4 cell count. The Miriam Hospital is one of four nationwide sites participating in the **Study to Understand the Natural History of HIV/AIDS** (**SUN**) in the era of HAART, funded by the **Centers for Disease Control and Prevention** (**CDC**). In the SUN, the overall prevalence of anal and cervical HPV infection was similar in both genital and anal areas, 92% and 86% respectively. However, high-risk anal HPV types were significantly more prevalent in the anal canal with a prevalence of 86%, compared with the cervical prevalence of 64%.

Studies evaluating the impact of HAART on cervical and anal HPV infection and cervical and anal cytologic changes have been inconclusive. While HAART does not seem to be associated with clearance of HPV, some studies have indicated that HAART was associated with regression of cervical disease,[4] and others have not found such an association.[5] Epidemiologic surveys indicate that the overall incidence of invasive cervical cancers have remained unchanged or increased slightly in the era of HAART. Anal cancers are increasing among HIV-infected women.[6]

The **Food and Drug Administration** (**FDA**) recently approved a new quadrivalent HPV vaccine that targets HPV types 6, 11, 16, and 18, for use in girls and women 9 to 26 years of age. This vaccine includes HPV types that are the most common cause of cervical warts (HPV types 6 and 11) and cervical and anal cancer (HPV types 16 and 18). In the general population, the vaccine is highly effective in preventing infection and diseases caused by the types included in the vaccine. The safety, immunogenicity, and efficacy of the HPV vaccine in HIV-infected adults is being studied through the AIDS Clinical Trials Network; The Miriam Hospital is one of the sites participating in the study.

HIV and Menopause

The number of women expected to experience menopause in the US is escalating with increasing life expectancy (81.7 years at present).[15] Similarly, HIV-infected women on HAART are living longer, and a growing population of women will experience menopausal transitions while HIV-infected.

Age at natural menopause among white women from 1960 to 1982 was on average at 51 years.[16] More recent

data suggest an even earlier onset (46 to 48 years old) of menopause in women with and at risk for HIV infection.[17] Several predictors of earlier age at menopause, including substance use, tobacco smoking, low relative body weight, low socioeconomic status, depression, and African American ethnicity, are common among HIV-infected women, a possible basis for HIV-infected women having menopause at an earlier age.[17]

There are conflicting data on the effect of HIV on menopausal symptoms. Factors that can influence menopausal symptoms, including smoking, stress, drug use, low body mass index, and race/ethnicity, are also relatively more prevalent among HIV-infected women. In order to evaluate menopausal issues among HIV-infected women in Rhode Island, a Menopause Clinic at The Miriam Hospital was established in 2004.

A woman was classified perimenopausal if she had signs and symptoms associated with estrogen deficiency, irregular menses, with or without FSH/LH elevation. A woman was considered menopausal if she was status-post bilateral salpingo-oophorectomy with or without hysterectomy, or if she had no menses for more than 1 year with elevated FSH/LH. Medical history, DEXA scan, mammogram, Pap smears, and blood work were collected on 77 women over the age of 45.

Mean age of women in the Menopause clinic was 49.9 years (42% were Caucasian, 33% were African-American, and 23% were Latino). These women had well controlled HIV infection with a median CD4 count of 416 K/μL, and were mostly on HAART with an undetectable plasma viral load (PVL) (<75 copies/mL). One third of the women were perimenopausal and 63% had experienced natural or surgical menopause. Most commonly reported menopausal symptoms were hot flashes (63%), night sweats (61%), and difficulties with sleeping (50%). Mammogram results for 57 women were all normal. Recent Pap smears of 76 women showed 69% normal, 6% ASCUS, 20% LGSIL, and 5% HGSIL.

Among 51 women who received DEXA scan results, 16% and 55% were diagnosed with osteoporosis and osteopenia, respectively. This prevalence is more than three times greater compared with HIV-uninfected women in the same age group in the United States.[18] The pathogenesis of the reduced bone mineral density noted in HIV-infected individuals is most likely multifactorial. Traditional risk factors for osteoporosis, including smoking, menstrual irregularities (oligomenorrhea and amenorrhea), substance abuse, and low body weight are more common in the HIV-infected population. In HIV-infected women in Rhode Island, the median weight was 161 lb and 15% weighted >200 lb. Low body weight is therefore not likely to play a role in the high prevalence of osteoporosis. Both HIV infection and certain antiretroviral therapy regimens have been implicated in the pathogenesis of osteoporosis, and longer follow-up will be needed to clarify factors associated with the high prevalence of osteoporosis that we noted in HIV-infected women in Rhode Island.

References

1. UNAIDS. Global Coalition on Women and AIDS.
2. CDC. Cases of HIV Infection and AIDS in the United States.
3. Rhode Island Epidemiologic Profile of HIV/AIDS for Prevention and Community Planning. RI Department of Health. 2007.
4. Minkoff H, Ahdieh L, et al. The effect of highly active antiretroviral therapy on cervical cytologic changes associated with oncogenic HPV among HIV-infected women. *AIDS* 2001;15:2157-64.
5. de Sanjose S, Palefsky J. Cervical and anal HPV infections in HIV positive women and men. *Virus Res* 2002;89:201-11.
6. Piketty C, Kazatchkine MD. Human papillomavirus-related cervical and anal disease in HIV-infected individuals in the era of highly active antiretroviral therapy. *Curr HIV/AIDS Rep* 2005;2:140-5.
7. Mofenson LM. Interaction between timing of perinatal human immunodeficiency virus infection and the design of preventive and therapeutic interventions. *Acta Paediatr Suppl* 1997;421:1-9.
8. Fawzi WW, Msamanga GI, et al. Randomized trial of effects of vitamin supplements on pregnancy outcomes and T cell counts in HIV-1-infected women in Tanzania. *Lancet* 1998;351:1477-82.
9. Garcia PM, Kalish LA, et al. Maternal levels of plasma human immunodeficiency virus type 1 RNA and the risk of perinatal transmission. Women and Infants Transmission Study Group. *NEJM* 1999;341:394-402.
10. Landesman SH, Kalish LA, et al. Obstetrical factors and the transmission of human immunodeficiency virus type 1 from mother to child. The Women and Infants Transmission Study. *NEJM* 1996;334:1617-23.
11. Mofenson LM, Lambert JS, et al. Risk factors for perinatal transmission of human immunodeficiency virus type 1 in women treated with zidovudine. Pediatric AIDS Clinical Trials Group Study 185 Team. *NEJM* 1999;341:385-93.
12. Minkoff H, Mofenson LM. The role of obstetric interventions in the prevention of pediatric human immunodeficiency virus infection. *Am J Obstet Gynecol* 1994;171:1167-75.
13. Groginsky E, Bowdler N, Yankowitz J. Update on vertical HIV transmission. *J Reprod Med* 1998;43:637-46.
14. Minkoff HL. HIV disease in pregnancy. *Obstet Gynecol Clin North Am* 1997;24:Xi-vii.
15. Paoletti R, Wenger NK. Review of the International Position Paper on Women's Health and Menopause. *Circulation* 2003;107:1336-9.
16. McKinlay SM, Bifano NL, McKinlay JB. Smoking and age at menopause in women. *Ann Intern Med* 1985;103:350-6.
17. Schoenbaum EE, Hartel D, et al. HIV infection, drug use, and onset of natural menopause. *Clin Infect Dis* 2005;41:1517-24.
18. Brown TT, Qaqish RB. Antiretroviral therapy and the prevalence of osteopenia and osteoporosis. *AIDS* 2006;20:2165-74.
19. Dolan SE, Kanter JR, Grinspoon S. Longitudinal analysis of bone density in human immunodeficiency virus-infected women. *J Clin Endocrinol Metab* 2006;91:2938-45.

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Identifying Acute HIV Infection In Rhode Island

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Acute HIV Infection is the earliest stage of HIV disease, immediately following the acquisition of the HIV virus. During this time the body is viremic but has not yet developed a detectable antibody response to the infection. In the absence of antibodies, standard HIV tests such as enzyme immunoassays and Western blot analysis will not detect the virus. The acute phase can last from a few weeks up to two months, and is characterized by peaking viral loads and increased viral shedding in the genital tract. [1,2,3] Newly infected individuals, typically unaware of their infection, are likely to engage in risky behaviors that increase the chance of transmission to uninfected individuals. Coupled together, increased viral loads and an unknown status significantly increase the public health risk of further transmission during the first two months following infection.[4,5] Up to 50% of new HIV infections may be attributed to transmission by individuals with acute HIV infection.[6,7]

The diagnosis of acute HIV infection has enormous implications for HIV prevention. Studies have shown that completing HIV counseling and testing, regardless of serostatus, correlates with a reduction in risk behavior.[8,9] In one study, almost 50% of **men who have sex with men (MSM)** receiving an HIV test reported a reduction in risk behaviors following the test.[9] Receipt of a positive HIV test has an even stronger impact on risk reduction.[10] Instituting educational and behavioral risk reduction programs at the earliest stage of HIV infection when transmission risk is greatest could have a large impact on subsequent transmission rates. Additionally, ongoing investigations are evaluating the impact of initiating antiretroviral therapy during the acute stage, with the dual goals of preventing the progression of disease within the infected individual and reducing subsequent transmission by lowering viral loads.[11-15]

Acute HIV infection is under-diagnosed in part because of nonspecific symptoms and a lack of awareness amongst clinicians. Symptoms of acute retroviral syndrome commonly include fever, fatigue, rash, pharyngitis, myalgia, headache, weight loss, and gastrointestinal discomfort.[14] The significance of symptoms during the acute stage is not fully understood, but studies suggest a possible correlation between the number, severity, and duration of symptoms and the rate at which disease progression occurs.[14] However, not all newly infected patients are symptomatic. Between 40 and 90% of acute HIV infection cases have the associated symptoms referred to as the acute retroviral syndrome. [4,16] Unfortunately, the inconsistent and nonspecific nature of these symptoms, combined with the reluctance of clinicians to ask about risky sexual and drug use behaviors, results in the frequent failure to diagnose acute HIV infection. In a retrospective analysis of serum from 563 patients evaluated for mononucleosis, which has similar symptoms, undiagnosed acute HIV infection was identified in seven patients (1.2%).[17] Improving awareness amongst clinicians of the link between symptoms of acute viral infections in sexually active individuals and HIV infection is critical for increasing the diagnosis of acute HIV infection.

Acute HIV infection is under-diagnosed in part because of nonspecific symptoms and a lack of awareness amongst clinicians.

Identifying acute HIV infection largely depends upon the timing of presentation of the infected individual and the type of HIV testing completed. Following infection, the virus rapidly replicates, reaching peak viral levels within approximately 3-4 weeks before declining to a steady state.[4] However, not until approximately four weeks after infection are antibodies detectable with standard assays including ELISA and Western blot.[16] This discrepancy between the time of infection and detection with conventional HIV tests is referred to as the "window period." During this period, acute HIV infection can be identified through nucleic acid testing. When a test for plasma HIV RNA yields a positive result and antibody testing is negative or indeterminate, a diagnosis of acute infection is made. Several studies have utilized HIV RNA testing with pooling techniques to create a cost-effective model for screening for acute HIV infection. In North Carolina, pooled HIV RNA tests were performed on serum samples with negative or indeterminate antibody results at state-funded testing sites. The HIV RNA testing resulted in identification of 23 cases of acute HIV infection, which increased overall diagnosis of HIV infection by 3.9%.[16] Pooled HIV RNA testing at STD clinics in Los Angeles and San Francisco increased diagnosis of HIV by 7.1% and 10.5%, respectively.[18] Both studies reported that pooling of samples allowed for cost-effective testing.

In 2006, the National Institute of Mental Health launched a multisite study to assess the feasibility of identifying acute HIV infection and risk behaviors surrounding recent HIV transmissions, with the goal of developing effective prevention interventions for acutely infected individuals. Among other sites, the **Lifespan/Tufts/Brown Center for AIDS Research (CFAR)** collaborated with the Yale University Center for Interdisciplinary AIDS Research to form a study site in New England. We report our experience with identifying cases of acute HIV infection in select high-risk populations in Rhode Island.

Methods

Two strategies to identify acute HIV infection were employed over a 15-month study period.

First, HIV RNA testing was incorporated into established HIV testing pro-

Table 1: Characteristics of participants with acute or recent HIV Infection.

Pt #	Screening/ Referral Site	Gender/Race	Age	Risk behaviors reported	Symptoms Reported	Diagnosis
1	Immunology Center	M White	52	Unprotected anal sex and other risky sexual activities with multiple HIV+ men	Dermatological problems	Recent
2	Immunology Center	F Latina	37	Unprotected sex with a male partner suspected of having outside sexual relationships	None; voluntarily sought HIV testing	Acute
3	Primary Care Physician	M White	45	Unprotected oral and anal sex with multiple male partners of unknown HIV status	Flu symptoms, chills, fever, malaise, headache	Acute
4	Megaplex Bathhouse	M Latino	39	Unprotected anal sex with a male partner of unknown HIV status	Myalgia, sore throat, fatigue	Acute
5	Whitmarsh STD Clinic	M White	32	Unprotected anal sex with multiple male partners of unknown HIV status	Syncope, shortness of breath, sore throat, headache	Recent
6	Immunology Center	M Cape Verdean	34	Unprotected sex with a female sex worker on a single occasion	Dysuria	Recent

grams at two locations. MAP Drug and Alcohol Rehabilitation Services provides substance abuse treatment and HIV education and prevention services to minority populations in the Providence area and conducts an HIV testing program one day per week. The Gay Megaplex, the largest bathhouse in New England, catering to men who have sex with men, has provided an environment conducive to risky sexual practices among men for more than a decade. An HIV and sexually transmitted infection testing program has operated at the bathhouse two to four times a month since 2000, staffed by local clinicians and health educators. Both the MAP and Megaplex testing programs utilize rapid HIV antibody testing, which provides results within 20 minutes. Individuals requesting an HIV test at either of these locations were informed of the limitations of antibody testing with respect to acute infection and invited to participate in the study. Persons with negative rapid antibody test results had serum samples collected for HIV RNA testing that was conducted at the Lifespan/Tufts/Brown CFAR laboratory. HIV RNA testing was performed using the Versant HIV-1 RNA 3.0 [bDNA] signal amplification nucleic acid probe assay using a pooling algorithm to reduce costs.

In a second strategy to identify acute HIV infection, clinicians at The Miriam Hospital Immunology Center, Miriam and Rhode Island Hospital Emergency Departments, and Whitmarsh STD clinic were educated regarding the clinical symptoms of acute retroviral syndrome. Patients presenting with appropriate symptoms who also reported recent sexual activity were informed of and offered referral to the study. If the patient agreed, an appointment with a study researcher was made within 72 hours. If standard HIV antibody test results were not available from the referring provider, a rapid test was performed. If this test was negative, serum samples were collected for HIV RNA testing.

Participants with a negative rapid test, or a negative or indeterminate ELISA or Western blot, followed by a positive HIV RNA test, were considered to have acute infection. Individuals with confirmed positive antibody testing but a documented negative antibody test within the previous six months were considered to have recent HIV infection and were also eligible for the study. Individuals with confirmed HIV infection were linked to the Miriam Hospital Immunology Center and invited to complete two interviews that examined behaviors surrounding acute infection.

Results

Three cases of acute HIV infection and 3 cases of recent HIV infection were identified in this study. All six individuals were between the ages of 30-55 years; five were male. All six reported unprotected sex with a partner of unknown or positive HIV status. Five of the six reported symptoms attributed to HIV infection. (Table 1)

Screening: One hundred thirteen participants from the community testing sites were screened with pooled HIV RNA testing; 65 from the Megaplex and 48 from MAP. Of these, one case of acute HIV infection was identified from the Megaplex. (Table 1, Pt# 4)

Referrals: Five suspected cases of acute HIV infection were referred to the study for evaluation; 3 from the Miriam Hospital Immunology Center, one from the Whitmarsh STD Clinic, and one from a primary care physician in the community. Of these five, two cases of acute and three cases of recent HIV infection were diagnosed. (Table 1)

Conclusions

We identified six individuals with acute or recent HIV infection within Rhode Island. Five were identified through referrals and one individual out

of 113 screened for acute infection with pooled HIV RNA testing was found to have acute infection. Considering screening programs in other states have pooled thousands of specimens for HIV RNA testing to identify one person with acute infection,[16] our testing yield was quite high in this study. Pooled HIV RNA testing is both feasible and appropriate to identify acute HIV infection in screening settings, especially in those with high background HIV prevalence and where there is a reasonable throughput of persons who can provide specimens for testing. Five of the six individuals diagnosed with acute or recent HIV infection were referred to the study by local clinicians, reinforcing the importance of stepping up identification of suspected acute HIV infection by providers in the community. Providers need to recognize the symptoms of acute retroviral syndrome and be cognizant of the need to ask patients about sexual and other HIV risk behaviors. Ongoing education of community providers is warranted in order to maintain appropriate levels of awareness. Improved provider awareness must be supported with the development and implementation of efficient identification and referral systems in order to expedite diagnosis treatment, and prevention counseling for those with acute or recent HIV infection.

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References

1. Pilcher CD, et al. Brief but efficient. *J Infect Dis* 2004; **189**:1785-92.
2. Chakraborty H, et al. Viral burden in genital secretions determines male-to-female sexual transmission of HIV-1. *AIDS* 2001; **15**: 621-7.
3. Pilcher CD, et al. Amplified transmission of HIV-1. *AIDS* 2007; **21**:1723-30.
4. Zetola NM, Pilcher CD. Diagnosis and management of acute HIV infection. *Infect Dis Clin North Am* 2007; **21**:19-48.
5. Schwarcz S, et al. Late diagnosis of HIV infection. J *Acquir Immune Defic Syndr* 2006; **43**:491-4.
6. Brenner BG, et al. High rates of forward transmission events after acute/early HIV-1 infection. *J Infect Dis* 2007;**195**:951-9.
7. Pao D, et al. Transmission of HIV-1 during primary infection: relationship to sexual risk and sexually transmitted infections. *AIDS* 2005; **19**:85-90.
8. Amaro H, et al. Heterosexual behavioral maintenance and change following HIV counseling and testing. *J Health Psychol* 2005;**10**:287-300.
9. MacKellar DA, et al. Recent HIV testing among young men who have sex with men. *Sex Transm Dis* 2006;**33**:183-92.
10. Colfax GN, et al. Sexual risk behaviors and implications for secondary HIV transmission during and after HIV seroconversion. *AIDS* 2002;**16**:1529-35.
11. Goujard C, et al. CD4 cell count and HIV DNA level are independent predictors of disease progression after primary HIV type 1 infection in untreated patients. *Clin Infect Dis* 2006;**42**:709-15.
12. Berrey MM, et al. Treatment of primary human immunodeficiency virus type 1 infection with potent antiretroviral therapy reduces frequency of rapid progression to AIDS. *J Infect Dis* 2001;**183**:1466-75.
13. Hare CB, et al. Seroreversion in subjects receiving antiretroviral therapy during acute/early HIV infection. *Clin Infect Dis* 2006; **42**:700-8.
14. Rosenberg ES, et al. Immune control of HIV-1 after early treatment of acute infection. *Nature* 2000; **407**:523-6.
15. Granich RM, et al. Universal voluntary HIV testing with immediate antiretroviral therapy as a strategy for elimination of HIV transmission. *Lancet* 2009; 373:48-57.
16. Pilcher CD, et al. Detection of acute infections during HIV testing in North Carolina. *NEJM* 2005; **352**:1873-83.
17. Rosenberg ES, Caliendo AM, Walker BD. Acute HIV infection among patients tested for mononucleosis. *NEJM* 1999; **340**:969.
18. Patel P, et al. Detection of acute HIV infections in high-risk patients in California. *J Acquir Immune Defic Syndr* 2006; **42**:75-9.

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Discussion of off-label usagae of drug or product: Versant HIV-1 RNA 3.0 [bDNA] signal amplification nucleic acid probe assay

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HIV/Viral Hepatitis Coinfection: The Immunology Center Experience

Lynn E. Taylor, MD

Chronic hepatitis C virus (HCV) infection is a significant public health concern among HIV-infected populations and a leading cause of morbidity and mortality in the **highly active antiretroviral therapy (HAART)** era.[1] Due to shared transmission routes, HIV/HCV coinfection impacts 30% of HIV-infected persons in the US and 4-5 million worldwide.[2,3] HIV accelerates HCV disease course, with more rapid progression to cirrhosis, liver failure and **hepatocellular carcinoma (HCC)** in coinfection. While coinfected individuals face greater risk of HAART-related hepatotoxicity than HIV-monoinfected persons, liver disease progression is slower in patients receiving HAART, and benefits outweigh risk. Early HAART introduction is recommended to reduce the rate of progression of hepatic disease.[4]

Anti-viral HCV medications offer the potential for viral eradication, termed **Sustained Virologic Response (SVR,** undetectable serum HCV RNA six months post-treatment). SVR can lead to regression of fibrosis; limit progression to cirrhosis, end-stage liver disease and HCC; and reduce liver-related mortality.[5,6] Based on results of five randomized clinical trials, therapy with pegylated interferon (pegIFN) plus **weight-based ribavirin (RBV)** is deemed effective for coinfected patients, although SVR rates are 10-15% lower than in HCV-monoinfection, and twelve month treatment duration irrespective of HCV genotype is typically indicated.[6,7] Therapy for coinfected patients is considered safe with close monitoring, although adverse events are more common and severe than in HCV-monoinfection. National and international guidelines endorse considering all coinfected patients for pegIFN/RBV.[8,9] Implementation of these guidelines is limited. Low treatment eligibility rates are due primarily to concomitant drug use and psychiatric illness, a common comorbidity.[10,11] Coinfection is distinguished by many social and medical needs, stigma and system-level problems with access. Referral of HIV-infected patients to off-site subspecialty HCV care yields low treatment rates (1-4%), while integrated care improves access and health outcomes.[12, 16]

Worldwide, 10% of HIV-infected persons are coinfected with chronic **hepatitis B virus (HBV)**. [17] HIV hastens HBV disease course, accelerating fibrosis progression, and increasing risk of HCC and liver-related death in HIV/HBV coinfection. The advent of well-tolerated, potent antiviral agents with a high barrier to resistance is beginning to mitigate these effects.

One-third of Immunology Center patients are coinfected with chronic HCV...

Miriam Hospital Immunology Center HIV/Viral Hepatitis Coinfection Clinic

Established in 2001, the Coinfection Clinic is an integral part of the Immunology Center.

All patients are screened for HCV, HBV and **hepatitis A virus (HAV)** upon their initial Immunology Center visit, with annual HCV antibody testing for antibody-negative patients thereafter. One-third of Immunology Center patients are coinfected with chronic HCV, and 3% with chronic HBV. Immunology Center physicians refer HCV-infected patients to Coinfection Clinic, and HBV-infected patients on an as-needed basis. Referrals are welcomed from outside physicians and come from Rhode Island, Massachusetts and Connecticut. Clinic is held weekly in the same suite where patients receive HIV and primary care. Forty patients have been seen monthly since the Clinic's inception. A coinfection physician and nurse staff the Clinic, with rotating Brown University gastroenterology and infectious disease fellows, residents and medical students.

Goals of the Coinfection Clinic include: patient education; evaluation of disease stage and other etiologies of liver disease; determining sequencing of HIV and HCV therapy; HAV/HBV vaccination if susceptible; HCV treatment; evaluation and treatment of drug dependence, psychiatric disease and other potential relative contraindications that may hinder successful HCV therapy; consultation to optimize HBV care; HCC screening; and care of cirrhosis. Approximately 30% of co-infected patients have cirrhosis, and as our cohort ages, HCC rates are rising. Many patients undergo subcutaneous liver biopsy, performed by Miriam Hospital interventional radiologists, to gauge the extent of fibrosis. If HCV therapy is deferred, biopsy is repeated in three years.[18] In a prospective study of coinfected patients in Baltimore, a population similar to our own, almost 30% of patients with minimal scarring at first biopsy had a substantial increase in fibrosis three years later.[20] Normal ALT levels do not guide decisions about biopsy or treatment because ALT does not reliably indicate the extent of fibrosis in coinfection. Steatosis, which may advance fibrosis and diminish SVR rates, may be exacerbated by didanosine and stavudine;[19] these medications are now contraindicated in coinfected patients.

To deliver HCV therapy to patients with active drug use and/or psychiatric illness, weekly visits for directly administered pegIFN injections are offered to optimize safety, tolerability, adherence and thus efficacy—and minimize treatment discontinuations—through aggressive management of adverse events. Phlebotomy is coordinated with nursing visits and a peer-based support group. Consideration for pegIFN/RBV is based on review of all assessments in accordance with current standards. However, our goal is to move beyond conventional criteria for treatment of patients with drug dependence and psychiatric illness. Whether an

individual wants and is able to follow through with evaluation is a more important consideration than whether drug use or psychiatric symptoms or history exist. There are no exclusion criteria based on addiction or psychiatric diagnoses.[20] We address addiction as a chronic, relapsing disease to be treated along with HIV and HCV. We prescribe a wide range of medications to stabilize psychiatric symptoms prior to HCV therapy, as well as buprenorphine, an opioid agonist/antagonist approved for office-based treatment of opiate dependence. A community-based organization, Family Service of RI, provides coordinated psychiatric care, counseling and case management for a subset of patients. For patients with pre-existing relationships with a psychiatrist, methadone program, therapist or case manager, a team including these providers is assembled. For others, we facilitate new linkages to needed services. Patients who are unstable for HCV therapy or who are homeless may reside at Sunrise House assisted living to undergo treatment, in collaboration with AIDS Care Ocean State.

To date 85 patients have undergone HCV therapy in the Immunology Center. Many report current drug use at initial visit. Approximately 75% have a history of non-substance-based psychiatric diagnosis, including major depression, anxiety, post-traumatic stress disorder, schizophrenia, bipolar disease and personality disorders. Overall, SVR rate is 24%. Thus three-quarters of treated patients remain HCV-viremic and may progress to end-stage liver disease. Only one coinfected patient has received a liver transplant via the Immunology Center, although several are currently wait-listed for transplantation.

Emerging Epidemic of Acute HCV (AHCV)

Recent reports demonstrate an alarming rise in AHCV (the initial 6-month period of newly acquired HCV infection, defined by HCV viremia, ALT rise and HCV antibody seroconversion), among HIV-seropositive men who have sex with men in association with traumatic sexual practices and sexually transmitted infections in the absence of IDU.[21-24] AHCV natural history is especially aggressive if acquired after HIV infection, while early treatment results in SVR rates of up to 91% with condensed therapy course.[25, 26] Diagnosis of AHCV is rare because most individuals are asymptomatic, or symptoms are mild and non-specific, yet diagnosis provides an opportunity for preventive intervention and effective treatment. Evaluating patients with unexplained ALT elevations for AHCV also establishes that hepatotoxicity is not caused by medications and prevents unwarranted HAART interruptions.[27] At Coinfection Clinic we routinely identify and treat AHCV. Patients with a negative HCV antibody and unexplained ALT elevation are tested for serum HCV RNA.[28]

ALT does not reliably indicate the extent of fibrosis in coinfection

Future Directions

Newer anti-HBV agents may lessen the burden of liver disease for HIV/HBV coinfected individuals, while HBV vaccine provides hope for stemming pandemic HBV. While individual viral kinetics and on-treatment virologic responses permit tailored HCV therapy to improve outcomes for coinfected patients, treatment initiation and SVR rates remain low, and the global HIV/HCV coinfection epidemic continues to grow. The most promising drugs in development, HCV protein-specific inhibitors, are intended to supplement RBV; non-IFN-based therapies will not be available in the near future.[29] Currently early phase trials of novel medications exclude HIV-seropositive persons. Their inclusion is a critical next step, along with lifting the federal ban on funding for needle exchange to help curtail new HCV infections.

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References

1. Bica I, McGovern B, et al. Increasing mortality due to end-stage liver disease in patients with human immunodeficiency virus infection. *Clin Infect Dis* 2001;32:492-7.
2. Sulkowski MS, Moore RD, et al. Hepatitis C and progression of HIV disease. *JAMA* 2002;288:199-206.
3. Alter MJ. Epidemiology of viral hepatitis and HIV co-infection. *J Hepatol* 2006;44(1Suppl):S6-9.
4. Hammer SM, Eron JJ, et al. Antiretroviral Treatment of Adult HIV Infection 2008 Recommendations of the International AIDS Society–USA Panel. *JAMA* 2008;300:555-70.
5. Bruno S, Stroffolini T, et al. Sustained virological response to interferon-alpha is associated with improved outcome in HCV-related cirrhosis. *Hepatol* 2007;45:579-87.
6. Chung RT, Andersen J, et al. Peginterferon Alfa-2a plus ribavirin versus interferon alfa-2a plus ribavirin for chronic hepatitis C in HIV-coinfected persons. *NEJM* 2004;351:451-9.
7. Torriani FJ, Rodriguez-Torres M, et al. Peginterferon Alfa-2a plus ribavirin for chronic hepatitis C virus infection in HIV-infected patients. *NEJM* 2004;351:438-50.
8. National Institutes of Health Consensus Development Conference Statement: Management of hepatitis C: 2002 – June 10-12, 2002. *Hepatol* 2002;36:S3-20.
9. Soriano V, Puoti M, et al. Care of patients coinfected with HIV and hepatitis C virus: 2007 updated recommendations from the HCV-HIV International Panel. *AIDS* 2007;21:1073-89.
10. Taylor LE, Costello T, et al. Psychiatric illness and illicit drugs as barriers to hepatitis C treatment among HIV/hepatitis C virus co-infected individuals. *AIDS* 2002;16:1700-1.
11. Fleming CA, Craven DE, et al. Hepatitis C virus and human immunodeficiency virus coinfection in an urban population. *Clin Infect Dis* 2003;36:97-100.
12. Hall CS, Charlebois ED, et al. Hepatitis C virus infection in San Francisco's HIV-infected urban poor. *J Gen Intern Med* 2004;19:357-65.

13. Fishbein DA, Lo Y, et al. Factors associated with successful referral for clinical care of drug users with chronic hepatitis C who have or are at risk for HIV infection. *J Acquir Immun Defic Syndr* 2004;37:1367-75.
14. Kresina T, Khalsa J, et al. Hepatitis C virus infection and substance abuse. *Clin Infect Dis* 2005;40 Suppl 5:S259-62.
15. Sylvestre DL, Loftis JM, et al. Co-occurring Hepatitis C, substance use, and psychiatric illness. *J Urban Health* 2004; 81:719-34.
16. Taylor LE. Delivering care to injection drug users coinfected with HIV and hepatitis C virus. *Clin Infect Dis* 2005;40 Suppl 5:S355-61.
17. Soriano V, Puoti Met al. Care of HIV patients with chronic hepatitis B. *AIDS* 2008;22:1399-410.
18. Sulkowski MS, Mehta SH, et al. Rapid fibrosis progression among HIV/hepatitis C virus-co-infected adults. *AIDS* 2007;21:2209-16.
19. McGovern BH, Ditelberg JS, et al. Hepatic steatosis is associated with fibrosis, nucleoside analogue use and hepatitis C virus genotype 3 infection in HIV-seropositive patients. *Clin Infect Dis* 2006;4:373-6.
20. Schaefer M, Heinz A, Backmund M. Treatment of chronic hepatitis C in patients with drug dependence. *Addiction* 2004;99:1167-75.
21. Danta M, Brown D, et al. Recent epidemic of acute hepatitis C virus in HIV-positive men who have sex with men linked to high-risk sexual behaviors. *AIDS* 2007:21;983-91.
22. Serpaggi J, Chaix ML, et al. Sexually transmitted acute infection with a clustered genotype 4 hepatitis C virus in HIV-1-infected men and inefficacy of antiviral therapy. *AIDS* 2006;202:233-40.
23. Gotz HM, van Dorrnum G, et al. A cluster of acute hepatitis C virus infection among men who have sex with men. *AIDS* 2005;19:969-74.
24. Van de Laar TJW, van der Bij AK, et al. Increase in HCV incidence among men who have sex with men in Amsterdam most likely caused by sexual transmission. *J Infect Dis* 2007;196:230-8.
25. Dominguez S, Ghosn J, et al. Efficacy of early treatment of acute hepatitis C infection with pegylated interferon and ribavirin in HIV-infected patients. *AIDS* 2006;20:1157-61.
26. Fierer DS, Uriel AJ, et al. Liver fibrosis in an outbreak of acute HCV in HIV-infected men. *J Infect Dis* 2008;198:683-6.
27. Luetkemeyer A, Hare CB, et al. Clinical presentation and course of acute hepatitis C infection in HIV-infected patients. *J Acquir Immune Defic Syndr* 2006;41:31-6.
28. Rockstroh JK, Bhagani S, et al. European AIDS Clinical Society (EACS) guidelines for the clinical management and treatment of chronic hepatitis B and C coinfection in HIV-infected adults. *HIV Med* 2008;9:82-8.
29. Foster GR. Past, present, and future hepatitis C treatments. *Semin Liver Dis* 2004;Suppl 2:97-104.

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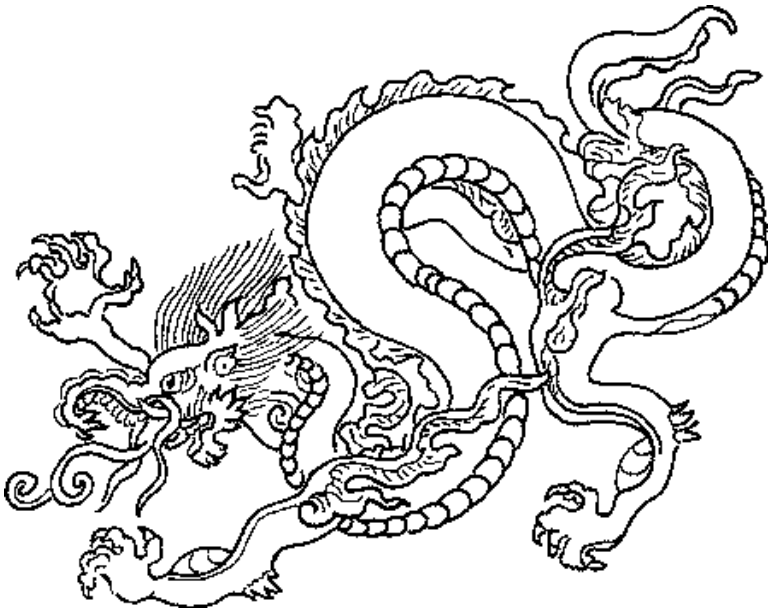

Changes In Demographics and Risk Factors Among Persons Living With HIV In an Academic Medical Center From 2003-2007

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National epidemiological data indicate that the HIV epidemic in the United States has been continually changing since its initial recognition in 1981. There has been no decrease in the incidence of HIV infection in the US for over a decade, and over 55,400 individuals were newly infected with HIV in the US in 2007.[1] Of these new infections, 62% contracted their infection through **sex with other men (MSM)** compared with 44% a decade ago.[2-3] Gradual annual increases in the proportion of incident infections in women in the US have been observed for the past 15 years, with the great majority acquired via heterosexual contact.[2] During this period, the number of HIV infections attributable to **injection drug use (IDU)** for both men and women dramatically declined, with estimates of a 42% overall reduction between 1994 and 2000 [4] and continued decreases in many areas through 2007.[5] There has been no significant improvement in the early diagnosis of HIV among newly infected individuals, either nationally or in Rhode Island, since the 1990s.[6]

The Samuel and Esther Chester Immunology Center at The Miriam Hospital track changes in demographics, risk factors, and clinical markers in order to evaluate the changing environment, and accessibility and adherence to care in the Rhode Island community. The Immunology Center, located on the campus of **The Miriam Hospital (TMH)**, is the largest HIV care provider in Rhode Island, with roughly 1,200 active HIV/AIDS patients in 2007, greater than 75% of the total known HIV/AIDS cases in the state. The proportion of Rhode Islanders known to be living with HIV who receive care at the Immunology Center has been consistently between 75 and 80% from 2003 through 2008.

Created in 1987, the Center was originally designed to fill a gap in care for HIV-positive women; but the composition of the clinic has gradually shifted to reflect the statewide epidemic. The Center now offers comprehensive health care for all Rhode Islanders living with HIV. Since 1994, a federal Ryan White Part C (Title III) grant has supported primary care and early intervention services. The Center provides multiple supportive services onsite including free HIV counseling and testing (rapid blood and oral antibody testing), social services, laboratory testing, antiretroviral adherence training, limited psychiatric care, viral hepatitis testing and treatment, and a substance use treatment referral system. It has served as the base site for past and current controlled clinical trials through the NIH AIDS Clinical Trials Group, and the USPHS Centers for Disease Control and Prevention.

Materials and Methods

Study Design

This evaluation examines data from the **Immunology Center database (ICDB)** for patients actively receiving care at the Immunology Center between January 1, 2003, and December 31, 2007. The ICDB system was created with funding from the NIH-supported **Lifespan/Tufts/Brown Center for AIDS Research (LTB-CFAR).** This system was designed after visiting several other CFARs, which had created electronic database systems that facilitated clinical research and enhanced the medical management of HIV/AIDS patients. This database, updated daily. assists physicians in patient management and enables researchers to access clinical data. At each visit, clinicians use the data base, allowing them to make corrections promptly.

The 18 physicians who provide HIV care for patients in the Immunology Center provide the patients' histories of treatment, laboratory results, and antiretroviral regimens, as well as other clinical and risk factor information.

Target Population

The Immunology Center provides care to any Rhode Island adult with HIV, and has targeted women, minorities, ex-offenders, and substance users for its services. For detailed analyses, we organized patients into four groups: **Baseline group:** all active patients who were enrolled and active in care on January 1, 2003 are included in the Baseline group. **Exiting group:** patients who died, moved away, transferred care or were lost-to-follow-up during each year (2003 to 2007). **Entering group**: all newly diagnosed patients registering to receive care from the Immunology Center, patients transferring care from another provider, and patients who were reactivated into care. Patients newly diagnosed for a specific year are defined as patients who were registered at the Immunology Center within that calendar year and who had been diagnosed with HIV within the previous twelve months. The "newly registered but not newly diagnosed" patients have transferred their care to the Center from any other medical facility and were diagnosed more than twelve months before registration date at the Immunology Center. Reactivated patients were discharged from the Immunology Center before 2003 and were reactivated during the time of the study. The **End Group** includes all patients alive, active, and in-care at the end of 2007.

Patient data for each year of the study period were aggregated and contingency table analyses were performed to compare demographics and HIV related risk behaviors. Contingency table analyses were also used to assess potential differences in important demographic characteristics. All 95% **confidence intervals (CI)** and associated *p*-values for the observed categorical, dichotomous outcomes were calculated using **Cochrane-Mantel-Haenszel (CMH)** chi-square tests. For variables that are not dichotomous (have more than two outcome levels and values in each cell are not large), Fisher Exact tests were used to examine statistical significance. Continuous variables were tested using Cochrane and Cox (1950) approximations examining whether the mean or median values of any two groups differ significantly. All tests are two-sided and p-values <= 0.05 were con-

sidered statistically significant. To investigate trends/association between the specific years and different covariates, normal chi-square tests were performed and score tables were used to analyze the trend/associations. All statistical analyses were performed using SAS version 9.1. The Miriam Hospital **Institutional Review Board (IRB)** approved all aspects of this study.

Results

Table 1a presents overall demographic data for the total number of active patients for 2003 to 2007. The clinic population has not changed significantly over the five-year period with respect to gender, race/ethnicity or age. However, important differences have occurred in the modes of transmission. (Table 1b). The proportion of transmissions via IVDU decreased significantly in both men and women from 2003 to 2007, while the proportion of sexual transmissions (including both MSM and heterosexual transmission in men) increased in both men and women. The risk factor data reported here are based on self-reports by the patients during their intake interviews with social workers.

Table 2a presents the demographic data for all newly diagnosed patients. The proportion of newly diagnosed non-Hispanic white patients increased significantly during that time period. The observed sharp increase in total HIV cases in 2004 may have been influenced by the introduction of rapid testing to the community by the largest **AIDS Service Organizations (ASOs)** in the greater Providence area. The proportion of AIDS diagnoses at entry into care at The Immunology Center rose from 28% to 37% during 2002-2007.

Table 2b presents transmission modes by gender of all newly diagnosed patients. A significant change has occurred in the mode of transmission for newly diagnosed women from 2003 to 2007. Prior to 2003, one third of Rhode Island women living with HIV had acquired the infection via IV drug use. Since 2003, women have seldom acquired HIV by this route. Since 2005, no newly diagnosed woman has had history of exposure by any route other than heterosexual sex.

Tables 3a and 3b provide CD4 categories (CD4 < 200, CD4 between 200 and 350, and CD4 > 350) and median CD4 values for existing and newly diagnosed patients each year of the study period. A CD4 count of <200 meets the CDC criteria for the diagnosis of AIDS. The median CD4 of the total clinic population gradually increased between 2005 and 2007. As anticipated because of the effectiveness of antiretroviral therapy, median CD4 counts among newly diagnosed patients were generally lower than CD4 counts among patients already in care at the Immunology Center, with the largest difference (110 cells/μL) observed in 2007 (p= 0.001).

Table 3b shows the CD4 counts of newly diagnosed patients by gender. In 2007, nearly 40% of both women and men entering into care met the CDC criteria for the diagnosis of AIDS, indicating an increasing delay in diagnosis and entry into care of Rhode Islanders living with HIV infection.

Overall, there were remarkably few differences between the Baseline and the End groups in relation to age, partnership status, primary language spoken and age at diagnosis. With respect to insurance status, more clinic patients had private insurance at the end of 2007 than in 2003 (22% vs. 32%). The proportion of patients receiving Ryan White Part C funded free care more than doubled during this period.

Table 1-a: Demographics of total active patients from 2003 to 2007*

	2003	2004	2005	2006	2007
Total	**N=925**	**N=954**	**N=991**	**N=1073**	**N=1144**
New patients	116	187	127	164	127
Deceased	27	27	17	23	20
Gender %					
Male	65	64	63	65	67
Female	35	37	37	35	33
Race/Ethnicity %					
Non-Hispanic Black	31	31	31	31	30
Non-Hispanic White	46	48	47	47	47
Hispanic	20	19	20	20	21
Others	3	2	2	2	2
Age at Diagnosis %					
< 25 Years	18	16	17	17	18
26-35 Years	44	43	40	40	39
36-45 Years	29	31	32	32	31
>45 Years	9	10	11	11	12

Table 1b: Transmission Mode by Gender, Total Active Patients from 2003-2007

	2003	2004	2005	2006	2007
Female	**N=326**	**N=350**	**N=363**	**N-374**	**N=380**
% Heterosexual*	63	69	73	74	75
% IDU	37	31	27	26	25
Male	**N=599**	**N=604**	**N=628**	**N=699**	**N=764**
% MSM	43	46	46	50	50
% IDU	31	26	25	23	21
% MSM/IDU	3	3	3	2	2
% Heterosexual/uncertain**	23	25	26	25	27

*Defined as no risk factors other than heterosexual intercourse.
**This category is not precise, as a large proportion of men who initially reported heterosexual transmission subsequently indicated that their major relationship had been MSM.

Discussion

The changes observed in the HIV epidemic in Rhode Island are generally similar to nationwide changes. Among new infections, African Americans and Hispanics accounted for 46% of all new HIV cases in Rhode Island despite the fact that these two groups comprise only 14% of the state's total population.[7] Nationally, the CDC estimates that 67% of all new HIV infections in 2006 were among African Americans and Hispanics.[2] With respect to new registrations in the Immunology Center at The Miriam Hospital, the proportion of African American patients remained relatively stable, while the

Table 2a: Demographics of Newly Diagnosed patients from 2003 to 2007

	2003	2004	2005	2006	2007
TOTAL	**N=47**	**N=110**	**N=64**	**N=84**	**N=76**
Gender %					
Male	72	62	68	72	76
Female	28	38	33	29	24
Race/Ethnicity %					
Non-Hispanic Black	36	36	28	32	21
Non-Hispanic White	32	44	42	46	57
Hispanic and Others	32	20	30	22	22
Age at Diagnosis %					
< 25 Years	19	13	11	8	17
26-35 Years	43	34	24	25	24
36-45 Years	26	35	38	47	31
>45 Years	13	19	28	19	29

Table 2b: Transmission Mode by Gender of Newly Diagnosed Patients from 2003 to 2007

	2003	2004	2005	2006	2007
TOTAL	**N=47**	**N=110**	**N=64**	**N=84**	**N=76**
Gender					
Female	**N=13**	**N=42**	**N=21**	**N=24**	**N=18**
Heterosexual %*	92	91	100	100	100
IDU %	8	9	0	0	0
Male	**N=34**	**N=68**	**N=43**	**N=60**	**N=58**
MSM + MSM/IDU %	50	65	65	61	68
IDU %	0	0	0	5	1
Heterosexual/uncertain**	50	35	35	33	33

*Includes all women who reported no risk factors other than heterosexual contact.
**Sexual category for men includes both MSM and heterosexual transmission as a large proportion of men who initially reported heterosexual transmission subsequently indicated that transmission had been via MSM.

proportion of Hispanic patients increased steadily between 2003 and 2007.

The risk factors are self-reported at clinic Intake. Some patients changed, or added to, the list of risk factors they initially reported. A number of men initially reported only heterosexual contact as their risk factor at the first interview, but later indicated that they were engaged primarily in MSM sexual contact. Initial reluctance to report MSM behavior may be attributed to cultural stigma. We observed a substantial increase in the numbers of new MSM clinic patients, with a greater than 30% increase in the proportion of MSM clinic patients in 2007 compared to 2003. Over the years, MSM as the primary risk factor has been largely reported by non-Hispanic white males. In 2007, of 34 newly diagnosed MSMs, only 9% were Hispanic, 12% percent were non-Hispanic blacks, and 79% were Non-Hispanic white.

The observed steady increase in the number of new MSM clinic patients during the past three years reflects a substantial change in the HIV epidemic in Rhode Island. From the 1980s through the early 1990s, 50% of all new HIV infections in the state were attributable to IDU.[7] Since 2000, with the development of clean needle exchange laws, **injection drug use (IDU)** as a primary risk factor for HIV transmission in Rhode Island has decreased markedly. The decline in incident HIV cases attributable to IDU has been well documented in other states as well.[5,8,9] MSM has become the major risk factor among men for acquiring HIV infection in Rhode Island. While evidence suggests that MSM sexual risk behavior has decreased in certain regions in the US in recent years,[10] this has not been the case in Rhode Island. In a recent population based, cross sectional community health survey in conducted in New York City, 60% of MSM reported not using a condom during the last sexual encounter.[11] Marks et al report that among a total sample of 2,205 MSM of color recruited from three urban areas in the US between 2005 and 2006, nearly one in four HIV positive MSM had engaged in risky sexual behavior with at least one partner.[12]

While many individuals living with HIV infection in the US have greatly benefited from advances in **highly active antiretroviral therapy (HAART)**, data from Baltimore indicate that many persons initially presenting with HIV infection have a greater severity of immunocompromise in recent years of the epidemic.[13] In Rhode Island, a greater severity of HIV disease was observed in newly diagnosed women over the past five years, but not in men.

Limitations

While our data are from the Immunology Center, which provides care to over 75% of Rhode Islanders living with HIV, the data may not be generalizable to all HIV clinical settings in the state. Our database records only those risk factors which are self-reported at the time of clinic intake. Data from patients who later report additional risk factors are not presently captured in our Center database.

Conclusion

The CDC estimates that over 250,000 people living with HIV/AIDS in the US are either: 1) unaware of their status and therefore are not receiving care and/or HIV treatment; 2) are aware of their status but not receiving HIV care. In the Immunology Center in 2007, 26 patients had advanced to AIDS at time of diagnosis: 48% were non-Hispanic white, 38% were non-Hispanic black and 14 % were Hispanic. Among Rhode Island women newly diagnosed in 2007, 39% had progressed to AIDS by the time of diagnosis; reflecting the fact that most women had not been tested earlier, because they were not aware that they had been exposed to a partner living with HIV infection. These data indicate the urgent need for a more effective statewide opt-out HIV screening program, an approach recommended by the CDC.[14]

Table 3a: CD4 levels of Existing versus Newly Diagnosed patients by Year

	2003	2004	2005	2006	2007
CD4 Cell Count Range					
1) Existing patients	**N=742**	**N=774**	**N=880**	**N=915**	**N=982**
% <200	17	17	17	13	12
% 200-350	22	24	25	22	22
% >350	61	59	59	65	66
Median CD4 cell count	423	403	397	432	443
2) Newly diagnosed patients	**N=46**	**N=108**	**N=63**	**N=83**	**N=70**
% <200	28	30	29	28	37
% 201-350	24	19	19	19	19
% >350	48	52	52	53	44
Median CD4 cell count	345	382	396	386	333

Table 3b: CD4 Levels of Newly Diagnosed Patients by Gender

	2003	2004	2005	2006	2007
Female	**N=13**	**N=41**	**N=21**	**N=24**	**N=13**
% <200	23	29	19	29	39
% 201-350	23	22	19	21	23
> 350	54	49	62	50	39
Median CD4 cell count	416	374	450	306	369
Male	**N=33**	**N=67**	**N=42**	**N=59**	**N=57**
% <200	30	30	33	27	37
% 201-350	24	16	19	19	18
% >350	46	54	48	54	46
Median CD4 cell count	339	382	385	394	333

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References

1. Hall HI, Song R, et al. Estimation of HIV incidence in the United States. *JAMA* 2008;300:520-9.
2. CDC. HIV/AIDS Surveillance Report, 2006. Vol. 18. Atlanta: US Department of Health and Human Services, CDC; 2008.
3. Centers for Disease Control and Prevention. HIV/AIDS Surveillance Report, 1997. Vol. 9, No.2. Atlanta, GA: US Department of Health and Human Services, CDC; 2006. http://www.cdc.gov/hiv/topics/surveillance/resources/reports/pdf/hivsur92.pdf.
4. Centers for Disease Control and Prevention. HIV diagnoses among injection-drug users in states with HIV surveillance—25 states, 1994–2000. *MMWR* 2003;52:634–6.
5. Beckwith CG, Moreira CC, et al. *Subst Abuse Treat Pre Policy* 2006;4;1:34
6. Keruly JC, Moore RD. Immune status at presentation to care did not improve among antiretroviral-naive persons from 1990 to 2006. *Clin Infect Dis* 2007;45:1369-74.
7. Rhode Island Department of Health, Division of Community Family Health and Equity, Office of HIV/AIDS & Viral Hepatitis, 2007 Rhode Island HIV/AIDS Epidemiologic Profile with Surrogate Data, 8-2008.
8. Des Jarlais DC, Perlis T, et al. HIV Incidence among injection drug users in New York City, 1990–2002. *Am J Pub Health* 2005, 95:1439-44.
9. Santibanez SS, Garfein RS, et al. Update and overview of practical epidemiologic aspects of HIV/AIDS among injection drug users in the United States. *J Urban Health* 2006; 83:86-100.
10. Brooks RA, Lee SJ, et al. Sexual risk behavior has decreased among men who have sex with men in Los Angeles but remains greater than that among heterosexual men and women. *AIDS Educ Prev* 2008;20:312-24.
11. Manning SE, Thorpe LE, et al. Estimation of HIV prevalence, risk factors, and testing frequency among sexually active men who have sex with men, aged 18–64 years—New York City, 2002. *J Urban Health* 2007;84:212-25.
12. Marks G, Millet GA, et al. Understanding differences in HIV sexual transmission among Latino and Black men who have sex with men. *AIDS Behav.* 2008 Aug 28. [Epub ahead of print]
13. Keruly JC, Moore RD. Immune status at presentation to care did not improve among antiretroviral-naïve persons from 1990-2006. *CID* 2007; 45:1369-74.
14. Mahajan A, Stemple L, et al. Consistency of state statutes with the Centers for Disease Control and Prevention HIV testing recommendations for health care settings. *Ann Int Med* 2009;150:263-9.

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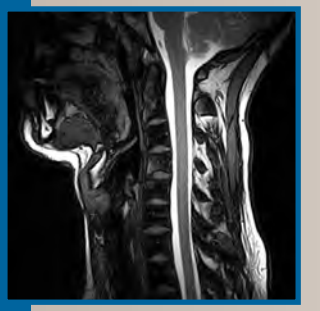

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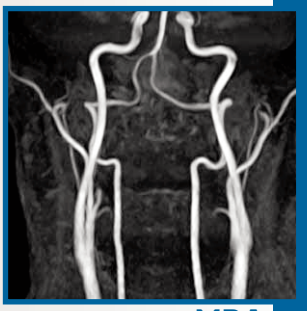

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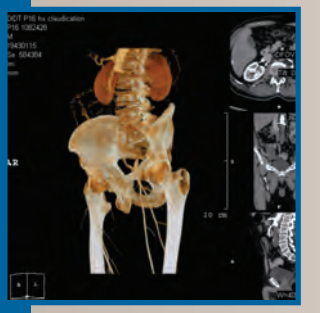

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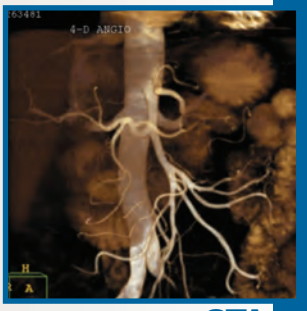

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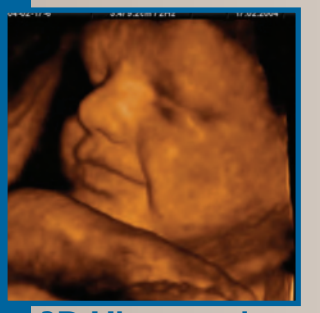

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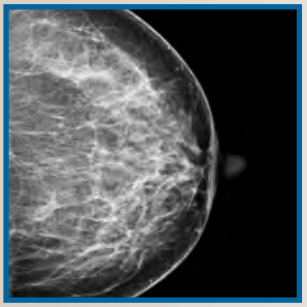

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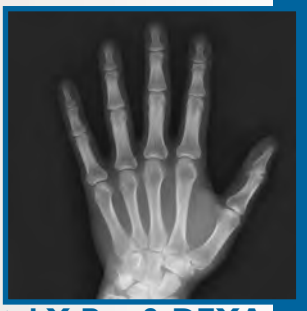

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HIV Among Marginalized Populations in Rhode Island

Sarah E Wakeman, MD, Nickolas D Zaller, PhD, Timothy P Flanigan, MD, Megan Pinkston, PhD, Brian T. Montague, DO MS MPH, Josiah D Rich, MD, MPH

Across the globe, HIV prevalence is highest among the most marginalized members of society. From Bangkok to Durban to Providence, HIV disproportionately affects those with the least access to care, those facing the most discrimination. In Rhode Island, these marginalized groups include injection and non-injection drug users, sexual minorities, current and former prisoners, the mentally ill, racial minorities, refugees, undocumented immigrants, commercial sex workers, and the poor, homeless and uninsured.

Demographics of the Epidemic

Although small, Rhode Island, with 1 million residents, is the second most densely populated state in the country. Since 1982, when HIV reporting began, 2,926 AIDS cases have been diagnosed in the state. In 2007, 1,627 persons were known to be living with HIV infection in Rhode Island,[1] and an estimated 600 to 700 individuals in Rhode Island are unaware that they are living with HIV infection. While only 9% of Rhode Islanders are Hispanic and 5% are Black, Hispanics make up 18% and Blacks 25% of those living with HIV, respectively. These racial disparities are even more apparent among pediatric cases: 52% of children with HIV are Black and 21% Hispanic. Of women in Rhode Island, 14% are Black or Hispanic, but 70 % of the women with known HIV are women of color. Overall, 75% of the cases diagnosed in the state since 1982 have been men; however, the gender gap has steadily narrowed since 1993 with a 14% increase in the proportion of female cases between 2006 and 2007 alone.

For the decade 1989-1999, 33% of initially diagnoses were made through the **Rhode Island Department of Corrections (RIDOC)** screening program.[2] The prevalence of HIV within the prison is 1.8%, four times the overall prevalence in the state.

The HIV prevalence among the refugee population in Rhode Island is also relatively high. Between 2000 and 2004, 1,467 legal refugees were resettled in Rhode Island, 2.3% of whom were HIV-positive. Compared to the reported HIV rate of 0.3% among the total 340,171 refugees resettled in the United States during that time period, Rhode Island's refugee HIV rate was 7.4 times the national average.[3]

Transmission

The common mode of HIV transmission among Rhode Island men is via **men who have sex with men (MSM)**, with a lesser proportion transmitted by **intravenous drug use (IDU)**.[1] Among women in Rhode Island, heterosexual contact is by far the most common mode of transmission. Since 2000, well over 80% of Rhode Island women newly diagnosed with HIV infection have reported no risk other than heterosexual contact. Among legal refugees, 81% reported heterosexual sex as their primary HIV exposure risk.

The use of non-injection illicit drugs contributes indirectly to the transmission of HIV, especially among individuals who abuse crack cocaine. The characteristics of the crack cocaine high (e.g., intense, short-lived), and the potential for binge use lead to increased frequencies of unprotected sex acts, often with multiple anonymous partners, which lead to an increased incidence in HIV infections.[4,5,6] The National Survey on Drug Use and Health for 2002 and 2003 demonstrated that the prevalence of crack cocaine use in the past year among persons aged 12 years and older was 3.6% in Rhode Island, compared to the national average of 2.5%.[7]

Testing

Rhode Island has 29 official HIV testing sites; all offer testing at low or no cost.[8] While most sites are located at community health centers, many of the state's social service agencies also serve as official testing sites. These community-based organizations include Crossroads, the states largest homeless shelter, Progresso Latino, an immigrant and refugee service agency, MAP Outreach (an addiction treatment and social service agency), and **AIDS Care Ocean State (ACOS)**. ACOS provides housing, case management, prevention and medical care to Rhode Islanders living with HIV. ACOS also offers free testing and has a street-based outreach team that distributes information on testing and prevention, and provides needle exchange services. To optimize diagnosis and prevention among high-risk male populations, rapid HIV testing has been offered since 2004 at the Megaplex, the largest MSM bath house in New England.[9] The RIDOC is an important location for HIV testing and diagnosis since one in four Americans with HIV pass through corrections each year.[10]

Treatment and Linkage to Care

The Miriam Hospital Immunology Center provides over 75% of the HIV care within the state and over 90% of the care for previously incarcerated individuals. Additionally, the Immunology Center provides care for refugees and those co-infected with Hepatitis C, and with co-occurring addiction and/or mental illness. A team approach, utilizing physicians, nurses, and social workers with the support of Ryan White funding, has provided a holistic approach to patient care.

Through successful collaborations with the RIDOC, the **International Institute of Rhode Island (IIRI)**, the Department of Health, and organizations such as ACOS and the Men's Health Collaborative, HIV providers in the state have been working to address the HIV needs of marginalized populations. Some doctors have formed lasting partnerships with specific agencies focused on these groups.

Doctors from The Miriam Hospital's Immunology Center and Brown University began visiting the RIDOC in 1986 to provide care for inmates infected with HIV. In 1988, when HIV testing became mandatory for all inmates, Dr. Carpenter, the then Chairman of Medicine, arranged state-of-the-art HIV disease management on a weekly basis for the incarcerated population.[11] In addition to HIV

care, the Brown-RIDOC collaboration has expanded to help address treatment of Hepatitis B and C, treatment of addiction, and mental health care. In addition to doctors providing HIV care while individuals are incarcerated, in 1996 Project Bridge was established. Project Bridge is an innovative, multi-disciplinary approach to providing intensive case management and continuity of care for HIV-positive ex-offenders. Working with a population that has a high proportion of homelessness, mental illness, and addiction, Project Bridge has provided HIV medical care to this often hard-to-reach population. At the 12-month follow-up meeting after release from prison, 96% of Project Bridge clients are still regularly receiving medical care at the Immunology Center.[12]

Brown physicians and others have also been involved in HIV prevention programs focused on IDUs. From 1995 to 2000, syringe exchange and a syringe prescription program, as well as the legalization of the sale of syringes, were implemented. In the decade following the launch of these programs, the percentage of IDU-related new HIV diagnoses showed an absolute reduction of 81%, decreasing from 53% in 1990 to 9.7% in 2003.[13]

For HIV-positive refugees, The Miriam Hospital Immunology Center is the main care provider. Between 2000 and 2006, 52 HIV-positive individuals classified as refugees by the United Nations High Commissioner for Refugees established care at The Miriam Immunology Center.[14] The majority of these refugees come from sub-Saharan Africa, which has a long resettlement history with Rhode Island. The Immunology Center, in conjunction with support from the International Institute and expertise from its social workers, has developed programs to work with refugees from West Africa. There are cultural and sociological challenges working with refugees from Liberia. For instance, many of these refugees may have been left in refugee camps for more than a decade.

Another crucial partnership has been created between the Men's Health Collaborative and AIDS Project Rhode Island Division of Family Services to address the needs of the MSM community, particularly those individuals visiting the Megaplex, a private men's club in Providence. In this very high-risk venue men often engage in anonymous sex with multiple partners. Through collaboration with the Megaplex, men are offered free hepatitis vaccinations as well as HIV and syphilis testing, as well as medical care. In addition, facilitated medical care is provided for those in need [(15)].

As Rhode Island faces an increased prevalence of crack cocaine use, the rate of new HIV infections is expected to rise given that there are no evidence-based, behavioral treatments or medications for cocaine abuse (e.g., like methadone or Buprenorphine for opiate addiction) offered at the community level for HIV-positive individuals who use crack cocaine. Because HIV-positive individuals who use crack cocaine face the additional stigma of addiction, they are more likely to avoid medical care and treatment. If treated, they are less likely to follow through, due to their often chaotic lifestyles and memory deficits resulting from crack cocaine use .[16] Therefore, it is imperative that the academic and medical communities work together again to develop innovative methods which integrate interventions for all aspects (i.e., medical, mental health, substance abuse, social) of the relationship between HIV and crack cocaine abuse.

These partnerships between academic medical communities and community care providers are necessary to reach out to the marginalized communities both to facilitate testing and to provide linkage to care. These approaches can have a lasting impact through the provision of treatment for those individuals who are traditionally marginalized from the health care system.

Conclusion

In Rhode Island, community care providers and academic leaders in HIV medicine have expanded testing, diagnoses and linkage to care in marginalized populations. These programs have emphasized not only testing and medical care, but also the needs of prisoners, IDUs, refugees, MSM and others.

HIV infection continues worldwide to spread most rapidly within marginalized communities. Academic medicine can play a leading role both in prevention and treatment by engaging with marginalized communities and forming close partnerships. This is done best through community outreach. The HIV epidemic requires a holistic response across multiple disciplines, which must address not only medical needs, but also addiction, mental illness, and health disparities. Partnering between the academic community, community-based organizations and the RIDOC has been an effective means to engage marginalized communities in Rhode Island.

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References

1. 2007 Rhode Island HIV/AIDS Epidemiologic Profile with Surrogate Data, Rhode Island Department of Health, August 2008.
2. Desai AA, Latta ET, et al. The importance of routine HIV testing in the incarcerated population. *AIDS Education & Prevention* 2002;(14) suppl B:45-52.
3. Desjardins S, Beckwith CG, et al. Caring for HIV-infected refugees in Rhode Island. *Med & Health RI* 2007;90:360-2.
4. Timpson SC, Williams ML, et al. Condom use behaviors in HIV-infected African American crack cocaine users. *Substance Abuse* 2003;24:211-20.
5. Moore J, Hamburger ME, et al. Longitudinal study of condom use patterns among women with or at risk for HIV. *AIDS and Behavior* 2001;5:263-73.
6. Kalichman SC, Belcher L, et al. Risk for HIV infection and use of cocaine among indigent African American men. *Am J Health & Behavior* 1998;22:141-51.
7. Office of Applied Studies. Results from the 2003 National Survey on Drug Use and Health: National findings (DHHS Publication No. SMA 04-3964, NSDUH Series H-25).
8. Rhode Island Department of Health, Office of HIV/AIDS & Viral Hepatitis. HIV Testing Sites: http://www.health.ri.gov/hiv/testingsites.php, Accessed 1-19-09.
9. Mayer KH. Optimizing high risk men's sexual health: the Providence bathhouse experience. Paper presented at APHA Scientific Session, 2006. http://alpha.confex.com/apha/134am/techprogram/paper_132530.htm, Accessed 1-19-09.
10. Hammett TM, Harmon MP, Rhodes W. The burden of infectious disease among inmates of and releases from US correctional facilities, 1997. *Am J Pub Health* 2002;92:1789-94.
11. O'Gara-Kurtis E. First do no harm, then make some noise. *Brown Med* 2007;(Fall) 24-9.
12. Macalino GE, Vlahov D, et al. Prevalence and incidence of HIV, hepatitis B virus and hepatitis

C virus infections among males in Rhode Island prisons. *Am J Pub Health* 2004;94:1218-23.
13. Zaller ND, Holmes L, et al. Linkage to treatment and supportive services among HIV-positive ex-offenders in Project Bridge. *J Hlth Care for the Poor and Undeserved* 2008;19:522-31.
14. Beckwith CG, Moreira CC, et al. A success story. *Substance Abuse Treatment, Prevention and Policy* 2006;1:34 doi:10.1186/1747-597X-1-1-34.
15. Beckwith CG, DeLong AK, et al. HIV infection in refugees. *Int J Infect Dis* 2008;doi:10.1016/j.ijid.2008.06.004.
16. AIDS Project Rhode Island. Men's Health Collaborative. http://www.aidsprojectri.org/educationprograms.htm. Accessed 1-19-09.
17. Brewer T, Zhao W, et al. Initiating HIV care. *AIDS and Behavior* 2007;11:897-904.

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The Implementation of the CDC's Revised Recommendations For HIV Testing In Medical Settings: A Rhode Island Update and Call For Action

Nicole E. Alexander, MD, Brian Alverson, MD, Robin Neale, MT (ASCP) SM, Curt G. Beckwith, MD

The Centers for Disease Control and Prevention (CDC) report 1 to 1.2 million people are living with HIV and AIDS in the United States, and HIV infection is a leading cause of illness and death.[1] An estimated 25% (252,000—312,000 persons) are unaware of their HIV infection, and therefore may unwittingly transmit the virus.[2] Marks and colleagues report that persons unaware of their HIV infection are more likely to engage in high-risk sexual behavior, with an HIV transmission rate 3.5 times higher compared to those aware of their HIV infection.[3] Therefore, although there have been significant advances in HIV treatment and life expectancy among HIV-infected persons, the estimated number of new infections in the United States in 2006 was 56,300—a significant increase over the reported annual number of incident infections during the previous decade.[4]

It is reasonable to conclude that the HIV/AIDS epidemic can be lessened substantially by alerting more HIV-positive persons to their status.[4] The percentage of patients ever tested for HIV was 38% in 1997, but increased minimally to 40% in 2006.[5] In September 2006, the CDC published revised recommendations for HIV testing in all health-care settings in order to foster earlier detection of the virus.[1] Previous HIV screening strategies focused on testing for only persons perceived to be at high risk (such as injection drug users, men having sex with men, and persons with other sexually transmitted infections), and those living among populations with increased HIV prevalence. HIV testing based upon risk assessment alone has resulted in a significant number of HIV infected individuals remaining undiagnosed, despite multiple opportunities for testing. Beckwith and his colleagues assessed patients newly diagnosed with HIV when admitted to the hospital with additional illness: 65% of these patients did not report traditional risk factors for HIV infection and were missed in previous tests.[6]

Because estimates of HIV incidence have not decreased with risk-based HIV testing, and because significant numbers of patients are diagnosed only after hospital admission with advanced AIDS, the CDC took several important steps toward reducing barriers to testing. The 2006 revised recommendations support routine "opt-out" HIV testing in health care settings for all patients between the ages of 13-64. Opt-out testing means that a provider informs a patient that HIV testing will be completed as part of their routine medical care unless the patient declines testing. The CDC recommended that informed consent for HIV testing be included in the consent for general medical care and that separate written informed consent for HIV testing should not be required. In this scenario, after patients are informed of the HIV test and given the opportunity to decline, the verbal consent for general medical care should be sufficient to incorporate consent for HIV testing. These guidelines also apply to pregnant women who should have HIV screening included in the routine panel of prenatal screening tests, without need for a separate signed consent form.

At the time the 2006 CDC recommendations were released, 20 states, including Rhode Island, still required separate written informed consent for HIV testing. Since that time, 11 states have enacted new legislation to streamline the consent process in order to increase uptake of testing.[8] In California, the San Francisco Public Health Department eliminated the requirement for separate written informed consent for HIV testing within all Public Health Department health care facilities and subsequently documented a highly significant increase in HIV testing and identification of new infections.[9] The mean monthly rate of HIV tests per 1000 patient-visits increased 4.5 times after the requirements for consent were changed. This dramatic increase in HIV testing served as the impetus for the State of California to enact new legislation in October 2007 to eliminate separate written informed consent for HIV testing. Rhode Island, however, remains one of the few states that still requires written consent for HIV testing.

In 2004 the CDC highlighted Rhode Island as one of the jurisdictions that had an elevated incidence of HIV or AIDS among women 15—45 years of age.[7] In addition, Rhode Island was one of the 21 states that surpassed the threshold of 17 new HIV diagnoses and 9 AIDS diagnoses per year per 100,000 women aged 15—45 years. Nevertheless, only 52.8% of pregnant women at the largest birthing hospital in Rhode Island had a known HIV status documented at time of delivery in 2006.[10] This testing rate is unacceptable since vertical transmission of HIV infection is preventable with the use of antiretroviral therapy. Vertical transmission of HIV infection from mother to child can be decreased from 25% with no intervention to less than 2% with antiretroviral therapy given in the perinatal period.[11] Unfortunately, in 2006, three infants were born with HIV infection in Rhode Island.

The concurrence of newborn HIV cases in 2006 and the release of the revised CDC recommendations for HIV testing created momentum to change Rhode Island's HIV testing legislation. After caring for a newborn whose HIV diagnosis was missed at birth, a concerned group of physicians coordinated efforts with the Rhode Island Department of Health, HIV/AIDS activist organizations, and other healthcare providers to pass a new law in July 2007.[12] The legislation was crafted by a wide group of advocates and put forward by Representative Eileen Naughton and Senator Charles Levesque. The law changed HIV testing among pregnant women from an opt-in to an opt-

out approach. The requirement for separate written informed consent for HIV testing during pregnancy was eliminated. Verbal consent for HIV testing is now permitted. In order to protect the rights of the patient, the legislation required that no woman be tested for HIV without her knowledge, and patients have the right to decline testing.

An analysis of HIV testing among pregnant women is underway at Women and Infants' Hospital where more than 9400 deliveries per year are performed, comprising over 72% of the deliveries in Rhode Island.[13] Hospital infection control personnel are surveying randomly selected obstetrical charts; and preliminary results indicate that prenatal HIV testing rates have increased to over 90% since passage of the legislation.[14] Since passage, there have also been no known vertical HIV transmissions in Rhode Island.

Separate written informed consent for HIV testing was acting as a barrier to testing among pregnant women in Rhode Island; removal of this barrier has led to increased testing rates. However, *separate written informed consent is still required in other medical settings within Rhode Island*. The HIV testing laws are still not in compliance with the CDC recommendations and violate humanitarian values. Despite substantial evidence presented to lawmakers, attempts to introduce legislation that would allow for routine opt-out HIV testing without separate written informed consent in all health-care settings failed in 2008. Opponents argued that discrimination and stigma pertaining to HIV still exist, and that elimination of the requirement for separate written consent may result in patients getting HIV-tested without their knowledge.

Stigma and discrimination toward HIV-infected persons are still a problem almost 30 years after the recognition of the epidemic in the US. We cannot allow persons who are unknowingly infected to remain undiagnosed when effective therapy is available. HIV treatment is both life-sustaining and life-saving. HIV treatment is available to all Rhode Islanders who need it through the AIDS Drug Assistance Program. Barriers to testing must be removed in order to expand the proportion of persons who are tested. Making HIV testing a routine part of medical care will reduce the stigma associated with HIV testing. Furthermore, a recent study has suggested that increasing testing and increasing the use of HIV medication could have a meaningful impact on eliminating the HIV epidemic as a whole.[15]

Routine opt-out HIV testing in medical settings needs to be implemented in Rhode Island, including the elimination of separate written consent

Routine opt-out HIV testing in medical settings needs to be implemented in Rhode Island, including the elimination of separate written consent. To do this, a variety of parties including lawmakers, AIDS activists, community service organizations, healthcare providers, patients, families of patients, and healthcare organizations must be involved in further legislative efforts. With a sense of urgency, there must be a willingness to agree on a consensus that will best achieve the goals that are important to all, namely, to decrease transmission of HIV and to increase knowledge of HIV serostatus. We are optimistic that the upcoming legislative session will see a collaborative effort to pass HIV testing laws in Rhode Island that will address the epidemic of 2009 and for years to come.

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References:

1. Branson BM, Handsfield HH, et al. Revised recommendations for HIV testing of adults, adolescents, and pregnant women in health-care settings. *MMWR Recomm Rep* 2006;55(RR-14):1-17; quiz CE11-14.
2. Glynn M, Rhodes P. Estimated HIV prevalence in the United States at the end of 2003 [Abstract]. Presented at the National HIV Prevention Conference, June 12-15, 2005, Atlanta, Georgia.
3. Marks G, et al. Estimating sexual transmission of HIV from persons aware and unaware that they are infected with the virus in the USA. *AIDS* 2006;20:1447-50.
4. Hall HI, et al. Estimation of HIV incidence in the United States. *JAMA* 2008;300:520-9.
5. CDC. Persons Tested for HIV — United States, 2006. *MMWR Recomm Rep* 2008; 57:845-9.
6. Beckwith CG, et al. Routine HIV testing among inpatients. *Arch Intern Med* 2002; 167: 2252-3.
7. CDC. Cases of HIV infection and AIDS in the United States, 2004. *HIV/AIDS Surveillance Report* 2005;16:16-45.
8. Bartlett JG, et al. Opt-out testing for human immunodeficiencyvirus in the United States. *JAMA* 2008;27;300: 945-51.
9. Zetola NM, et al. Association between rates of HIV testing and elimination of written consents in San Francisco. *JAMA* 2007;297:1061-2.
10. Ballard-Dwan J. Women with HIV status documented at time of delivery, January 2007. Unpublished data.
11. Cooper E, et al. Women & Infants Transmission Study, 1990-1999. *JAIDS* 2002;29:484-94.
12. http://www.rilin.state.ri.us/BillText/BillText07/SenateText07/S0841Aaa.htm
13. http://www.womenandinfants.org/documents/2008(2).pdf
14. Neale R, et al. Women and Infants' 2008 HIV Testing in Pregnancy. Unpublished data.
15. Granich RM, et al. Universal voluntary HIV testing with immediate antiretroviral therapy as a strategy for elimination of HIV transmission. *Lancet* 2009; 373:48-57.

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Images In Medicine

Fibroblastic Polyp (FP)/Perineurioma of the Colon

Robert Bagdasaryan, MD, and Ramakrishna Nayak, MD

A 54 years old man undergoing colonoscopy had a 0.5 cm polyp excised at 20 cm. The polyp demonstrated mucosal proliferation of monomorphic spindle cells with separation, entrapment and disorganization of colonic crypts. Disorganization of muscularis mucosae as well as a few eosinophils admixed with tumor cells were appreciated. No mitotic figures, atypia or necrosis was present.

Eslami-Varzaneh et al first described **fibroblastic polyp (FP)** in 2004 by as a distinctive type of mesenchymal polyp of the colorectum.[1] In 2005, Hornick and Fletcher reported a series of 10 intestinal perineuriomas with similar histologic features, 8 of which represented colorectal mucosal polyps.[3] Further investigations concluded that fibroblastic polyp and intestinal perineurioma are 2 names for a single entity.[4]

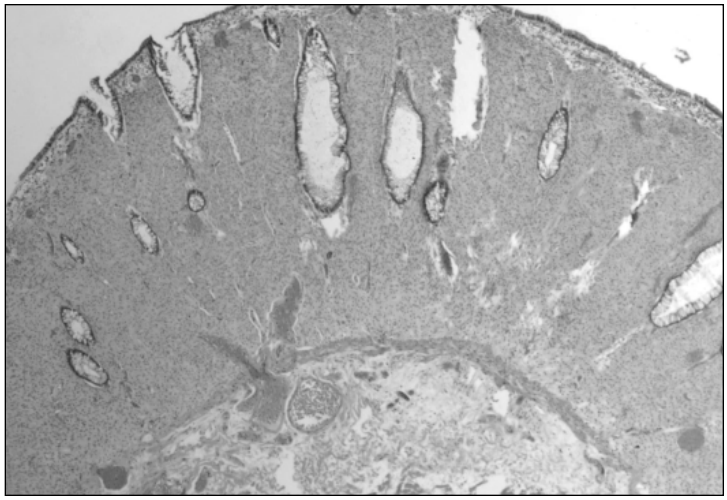
Clinically, FPs are less than 0.6 cm, and present as solitary lesions in the distal large bowel and behave in a benign fashion.[1,2,3]

Immunohistochemically, the polyps stain positively with GLUT-1 and Collagen IV in 100% of cases, and for EMA and Claudin-1 in 93% of cases.[4]

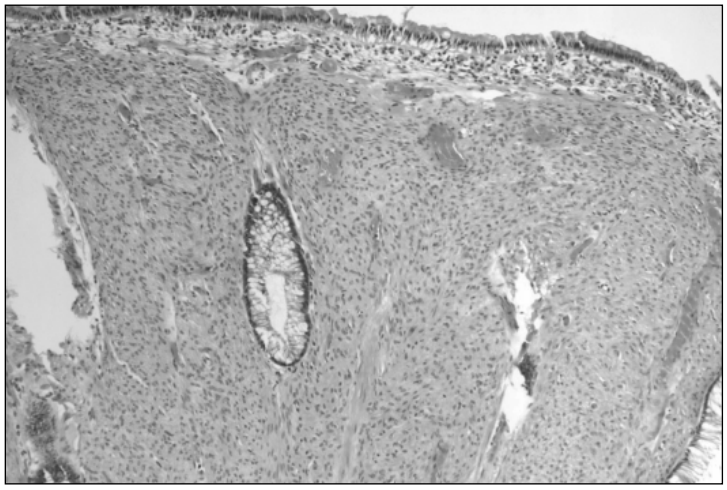
Ultrastructurally, elongated cells with features of perineural differentiation including long, slender cytoplasmic processes with pinocytotic vesicle and external lamina are seen.

Fibroblastic polyp/perineurioma is not a common lesion but is probably underrecognized.[1,2,3] Some cases are likely called "fibromas" or neurofibromas, and cases with serrated crypts are most likely diagnosed as hyperplastic polyps or hyperplastic polyp with stromal fibrosis. In fact, some of the lesions display only a minimal amount of diagnostic stromal proliferation and they can be easily missed.

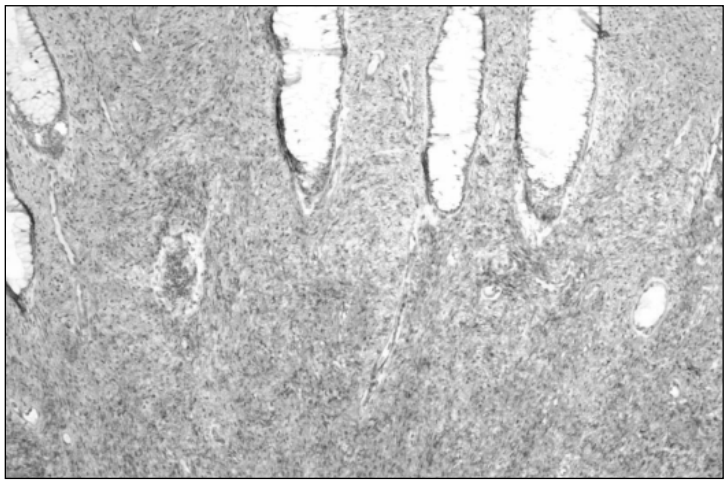
A greater awareness to this entity will lead to an increase in its diagnosis.



Fibroblastic polyp. Low power view.



Fibroblastic polyp. Intermediate power view.



Fibroblastic polyp. Diffuse staining with Collagen IV.

References

1. Eslami-Varzaneh F, Washington K, et al. Benign fibroblastic polyps of the colon. *Am J Surg Pathol* 2004; 28:374-8.
2. Groissman GM, Polak-Charcon S, Appelman HD. *Histopathol* 2006;48:431-7.
3. Hornick JL, Fletcher CDM. *Am J Surg Pathol* 2005; 29:859-865.
4. Groissman GM, Polak-Charcon S. *Am J Surg Pathol* 2008;32:1088-93.

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GERIATRICS FOR THE PRACTICING PHYSICIAN

QUALITY PARTNERS OF RHODE ISLAND
Quality Partners of RI
EDITED BY ANA TUYA FULTON, MD

Optimal Hip Fracture Management In High-Risk Frail Older Adults

Lynn McNicoll, MD, and Peter G. Fitzgibbons, MD

CASE #1 NON-OPERATIVE CASE

Mr. G, age 84, fell on the ice and suffered a right hip fracture. His medical history included heart disease, diabetes, emphysema, and asbestosis. Before the fall, he was oxygen-dependent but living independently. His surgery was delayed while his pulmonary status was assessed. Unfortunately, he developed complications; and it was decided not to operate. After discharge to a rehabilitation facility, he suffered from pain, anorexia, constipation, delirium, aspiration pneumonia, pressure ulcers, weight loss, and cognitive and functional decline. After multiple hospitalizations, the family and patient elected hospice care. The patient died 3 months after the fracture.

CASE #2 OPERATIVE CASE

Mrs. J, age 88, suffered a fall and sustained a displaced right femoral neck fracture. She lived independently with her husband, walked with a cane, and had a history significant for interstitial lung disease and coronary artery disease. She was admitted to the hospital and underwent uncomplicated right hip hemiarthroplasty. Although it was difficult to wean her off the ventilator, she was extubated and sent to the floor. She remained in the hospital due to persistent wound drainage, and also needed oxygen. Early on the morning of post-operative day #7, she developed respiratory distress and was transferred again to the intensive care unit and intubated, and treated for sepsis presumed secondary to pneumonia. Two days later, after a family meeting, the patient was made "comfort measures only" and died that day.

These cases demonstrate the complexities of managing high-risk patients. This paper presents some of the important orthopedic and medical concerns in managing these patients.

OVERVIEW OF HIP FRACTURES IN OLDER PERSONS

In 2006, the National Center for Health Statistics reported 330,000 hospital admissions for hip fracture: 293,000 (89%) occurred in patients over the age of 65; 238,000 (72%) affected women.[1] Hip fractures have a significant impact on mortality and functional status. Various studies have looked at one-year mortality following hip fracture; results range from 14 to 36%.[2] A large prospective study of operative hip fractures found that 41% of patients regained their preoperative ambulatory status, 40% required assistive devices, 12% became limited ambulators, and 8% became nonambulatory.[3] While hip fractures in the young, healthy population are rare high-energy injuries, those in the geriatric population are low-energy fractures often associated with osteoporosis.

The term hip fracture can refer to fractures of the femoral neck, or intertrochanteric or subtrochanteric regions. These anatomical distinctions are important, because different degrees of vascular disruption and mechanical stability will affect both treatment and prognosis.

Femoral neck fracture - displacement of the fragments indicate that the blood supply to the femoral head has been disrupted, with the subsequent likelihood of avascular necrosis of the femoral head even if the fragments are anatomically reduced. While a nondisplaced fracture may be fixed with screws alone, a displaced fracture necessitates prosthetic replacement of the femoral head.

Intertrochanteric fracture – the blood supply to the femoral head is usually preserved, and the fracture may or may not

Table 1: Risk Factors for Poor Outcomes in Hip Fracture Patients

Pre-existing Factors	Preoperative Factors	Postoperative Factors
Age	Type of fracture	Overall prognosis
Baseline functional status	Open or closed fracture	Risk for non-healing surgical repair
Baseline Mobility	Additional injuries	Risk of severe agitation or delirium
Baseline cognitive status	Rhabdomyolysis	Risk of post-operative fall and injury
Dementia	Time since fracture	Risk of worsening nutritional status
Nutritional status	Delay in surgery	Risk of inability to extubate
ASA score	Delirium	
Severity of Osteoporosis	Degree of pain	
Lung disease		
Cardiac disease		
Renal disease		
Anticoagulation		
Terminal Illness		

Table 2: Outcomes for hip fracture patients treated operatively and non-operatively

	Operative (n=46) n (%)	Non-Operative (n=38) n (%)
Complications		
Urinary Tract Infection	7 (15)	10 (26)
Pneumonia	6 (13)	5 (13)
CVA	2 (4)	2 (5)
Pressure Sores	0 (0)	4 (11)
Causes of Death		
Pneumonia	7 (15)	9 (24)
Acute MI	5 (11)	5 (13)
Congestive Heart Failure	0 (0)	3 (8)
Urinary Tract Infection	4 (9)	4 (11)
Mortality (1 year) %	30%	45%
Mortality (2 year) %	41%	58%
Dependent Ambulation %	62%	90%

Ref: 9

be mechanically stable, depending on the particular fracture pattern. Treatment is with either a side plate and interlocking screw into the femoral head (eg., Dynamic or Compression Hip Screw) or with an intramedullary nail and interlocking femoral head screw (eg., Gamma Nail). Patients with intertrochanteric fractures have higher one-year mortality rates than those with femoral neck fractures, as well as worse short term functional outcomes.[4]

Subtrochanteric fracture –a spectrum of fractures primarily involving the 5 cms below the lesser trochanter. These fractures are by definition unstable and require a long intramedullary device in the same manner as a femoral shaft fracture.

Risk Factors for Poor Outcomes

Risk factors for poor outcomes in hip fracture patients can be divided into 3 categories: preexisting conditions, preoperative fracture conditions, and potential postoperative considerations.[5-9] (Table 1) Preexisting factors are pre-fracture risk factors that increase the risk of morbidity and mortality, including baseline functional and cognitive status, comorbid conditions such as lung disease (especially if patient has a baseline oxygen requirement), cardiac (recent myocardial infarction, unstable angina, or congestive heart failure), and renal diseases (especially chronic renal insufficiency or failure). The number and severity of comorbid conditions are also extremely important. The type of fracture and the circumstances around the trauma that resulted in the fracture are also important considerations. Other more urgent injuries may take priority over the hip fracture. For example, acute renal failure from rhabdomyolysis may occur in patients who fell and were unable to get medical attention for a long period of time, thus delaying surgery. Postoperative concerns include the likelihood of negative outcomes, such as inability to extubate, severe delirium, agitation, fall, and injury or dislocation of the prosthesis. Patients with severe osteoporosis and poor nutrition are at greater risk for non-healing of the surgical site, increasing their likelihood of requiring additional operations.

Hip fracture patients often have several co-morbidities that may or may not have been previously addressed, and questions are often raised about the need for pre-operative medical intervention. The impact of the time to operative intervention after a hip fracture has been addressed in several large studies. Delays beyond 24 or 48 hours are associated with increased mortality, prolonged hospital stay, development of pressure ulcers, and worse functional outcome.[5,6,10,11]

As noted in a recent meta-analysis, there are few randomized studies from which to draw evidence on the outcome of non-operative treatment compared to operative treatment of hip fractures.[12] Most prospective studies reveal increased mortality and morbidity with worse functional status among non-operative cohorts.[9] (Table 2) Only 10% of patients with non-operative management resume walking.

Strategies for Improving Outcomes

Various programs to manage complicated older patients with hip fractures have been described. The primary goal for some of them is to prevent delirium; for others, the goal is to prevent postoperative falls. Both outcomes are associated with higher costs, morbidity and mortality. However, two common themes seem to permeate these programs.[13,14]

One theme is the collaborative relationship between a medical team (often led by geriatricians) and the orthopedic team. Hip fracture patients are often medically complicated and may have exacerbations of chronic medical conditions. Thus, a collaborative relationship with the medical team optimizes the medical and surgical management.

The second theme is the multifactorial nature of the interventions. No single action will improve outcomes. The problem is multifaceted, and interventions must be individualized to the patient. Most programs include education of front-line staff (especially nurses and aides) on dementia, delirium and falls. The multidisciplinary approach includes nurses, aides, rehabilitation professionals, nutritionists, pharmacy, and the medical and orthopedic teams. Standardized order sets have also been shown to work well, especially when developed by a multidisciplinary team.[15] Several protocols have targeted early and aggressive ambulation and early removal of bladder catheters.

Summary

Management of high-risk hip fracture patients is complicated. The optimal surgical decision must be individualized and made promptly, with the assistance of all important team members, including primary care doctors, patient, family, and the orthopedic team. The risks of delaying surgery are significant and should be avoided if possible. Strategies for improving outcomes in these patients include collaborations with medicine and delirium prevention protocols, especially with early ambulation.

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References

1. Centers for Disease Control and Prevention. National Center for Health Statistics. Health Data Interactive. www.cdc.gov/nchs/hdi.htm.
2. Zuckerman JD. Hip fracture. *NEJM* 1996;334:1519-25.
3. Koval KJ et al. Ambulatory ability after hip fracture. *Clin Orthopaedics Related Res* 1995; 310:150-9.
4. Haentjens P, et al. Survival and functional outcomes according to hip fracture type. *Bone* 2007;41:958-64.
5. Bottle A, et al.. Mortality associated with delay in operation after hip fracture. *BMJ* 2006;332:947-51.
6. Sebestyen A, et al. Effect of surgical delay on early mortality in patients with femoral neck fracture. *Internat Orthopedics* 2008;32:375-9.
7. Petersen MB, et al. Factors affecting postoperative mortality of patients with displaced femoral neck fracture. *Injury* 2006;37:705-11.
8. Formiga F, et al. Mortality and morbidity in nanogenarian patients following hip fracture surgery. *Gerontol* 2003;49:41-5.
9. Ooi LH, et al. Hip fracture in nanogenarians. *Int J Care of the Injured* 2005;36:142-7.
10. Elliott J, et al. Predicting survival after treatment for fracture of the proximal femur and effect of delays to surgery. *J Clin Epidemiol* 2003;56:788-95.
11. Al-ani AN, et al. Early operation on patients with a hip fracture improved the ability to return to independent living. *J Bone Joint Surg* 2008; 90:1436-42.
12. Handoll HHG, Parker MJ. Conservative versus operative treatment for hip fractures in adults. *Cochrane Database of Systematic Reviews* 2008, Issue 3. Art. No.: CD000337. DOI: 10.1002/14651858.CD000337.pub2
13. Marcantonio ER, et al. Reducing delirium after hip fracture. *J Am Geriatr Soc* 2001;49:516-22.
14. Stenvall M, et al. A multidisciplinary, multifactorial intervention program reduces postoperative falls and injuries after femoral neck fracture. *Osteoporosis Int* 2007;18:167-75.
15. Personal communication with University of Missouri Donald W. Reynolds Program in Geriatrics, "The Hip Fracture Pathway at the University of Missouri".

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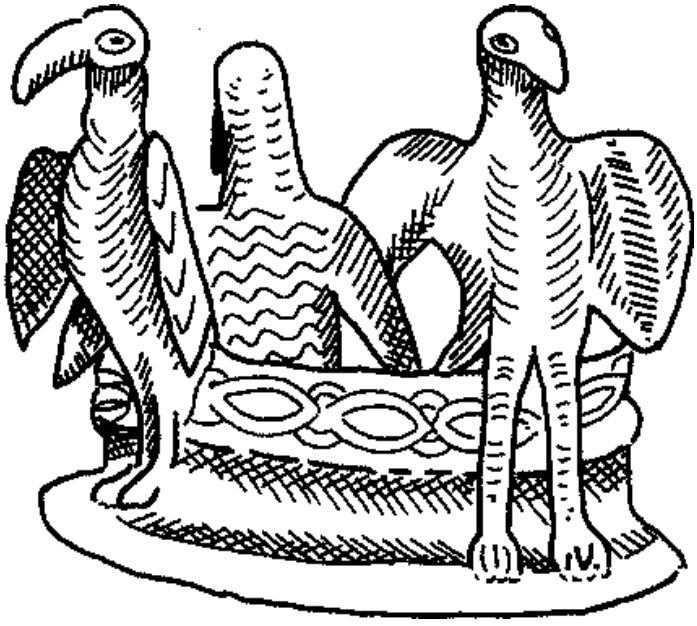

Health By Numbers
Rhode Island Department of Health • David Gifford, MD, MPH, Director of Health
Edited by Samara Viner-Brown, MS

Evaluation of Rhode Island's Pediatric Practice Enhancement Project (PPEP)

Alvaro Tinajero, MD, MPH, ScM, and Deborah Garneau, MA

More than 12 million (13.9%) US children meet the Maternal and Child Health Bureau (MCHB) definition of **children with special care needs (CSHCN).**[1, 2] In Rhode Island 41,783 children (17.2%) have chronic physical, developmental, behavioral, and/or emotional conditions that require health and supportive services beyond the type or volume required by other children.[3, 4] CSHCN have multiple medical needs and caretakers often struggle to navigate a complex system to obtain medical, mental health, educational, and social services.[5] The attributes of care for CSHCN included in the American Academy of Pediatrics' medical home definition of delivering primary care call for care that is accessible, continuous, comprehensive, family-centered, coordinated, compassionate, and culturally effective.[6, 7] The **Pediatric Practice Enhancement Project (PPEP)** is Rhode Island's medical home initiative to enhance medical practices and coordination of care for CSHCN. Approximately 6% of Rhode Island's CSHCN population is enrolled in PPEP. This study compares health service utilization and health-related expenditures between PPEP and the standard care model for CSHCN in Rhode Island. This evaluation will inform a possible expansion of the PPEP model into practices with standard care.

Methods

Neighborhood Health Plan of Rhode Island (NHPRI) claims and PPEP case management databases were linked to examine CSHCN encounters, claims per visit and expenditures per claim for the two models of care. Sample selection for both groups included being NHPRI insured from 01-01-2004 to 12-31-2007 and between 1 month and 18 years of age. Children younger than one month were excluded from this analysis because the PPEP model does not provide inpatient coordination at birth hospitals. The PPEP comparison group was CSHCN with SSI/Related group insurance. A total of 16,150 CSHCN visits met study criteria and were included in the sample (PPEP=4,180; standard care=11,970). Study samples were stratified by **outpatient** (OV) and **emergency visits** (EV), **inpatient admissions** (IA), and calendar year, and analyzed using parametric (two sample t-test) and non-parametric methods. Because samples were not normally distributed, the Kruskal-Wallis statistic was used to determine differences in test scores in the overall and stratified analyses. Main study questions included 1) Is PPEP associated with lower emergency room and inpatient service use and higher utilization of primary care/preventive services? and 2) Are there differences in paid claims between the PPEP and standard of care models?

Results

On average, PPEP encounters per child were 20.9% higher and claims per visit 3.9% lower compared to standard care. (Table 1) Cost analysis in this study was based on paid claims. Overall and annual expenditures per visit were lower for PPEP. Payments per claim were $70.5 lower for PPEP (p<.0001) for the entire period. Annual average differences ranged from $13 (2007) to $22 (2006).

Average IA and OV per child were 61.9% lower and 20.9% higher for PPEP, respectively. (Table 2) Average paid claims for PPEP participants were $449.9 lower (-15.1%) for IA (p<.001) and $21.6 higher (7.6%) for OV (p<.0001). IA per child and claims per visit were lower for PPEP in each year. The only exception was a higher claim per visit ratio (10.5%) in 2006. PPEP paid claims for IA in this year were $18.9 higher but this difference was not statistically significant (p<.83). OV for PPEP participants were lower than for standard care in each year. With the exception of 2007, claims per OV were lower in the PPEP model. Also, with the exception of 2004 (-$1.3), paid claims were higher (range=$2.2-$10.5) for PPEP than for the standard care model (all years p<.0001).

Although the 2004-2007 average EV per child (41.2%) and claims per EV (9.9%) were higher for PPEP, paid claims for this model were $10.8 lower than for standard care

TABLE 1

ALL CLAIMS

Year	Model	Children w/ Any Encounter (N)	Encounters (N)	Average Child Encounters	Claims from all Encounters (N)	Average Claims per Encounter	Average Payment per Claim ($)	Average Difference ($)	Kruskal-Wallis Test
2004	ppep	907	8,318	9.2	15,763	1.9	101.4	-19.9	p<.0001 (hs)
2004	non ppep	2,321	19,973	8.6	44,591	2.2	121.3		
2005	ppep	1,077	12,423	11.5	26,821	2.2	99.5	-15.8	p<.0001 (hs)
2005	non ppep	2,806	27,085	9.7	60,908	2.2	115.3		
2006	ppep	1,202	13,774	11.5	35,281	2.6	89.9	-21.9	p<.0001 (hs)
2006	non ppep	3,160	32,366	10.2	84,961	2.6	111.8		
2007	ppep	994	14,111	14.2	31,917	2.3	100.2	-12.9	p<.0001 (hs)
2007	non ppep	3,683	36,232	9.8	76,799	2.1	113.1		
	ppep	**4,180**	**48,626**	**11.6**	**109,785**	**2.2**	**391**	**-17.6**	p<.0001 (hs)
	non ppep	**11,970**	**115,656**	**9.6**	**267,259**	**2.3**	**462**		
2004-7 difference				**20.9%**		**-3.9%**	**-70.5**	**-17.6**	**p<.0001 (hs)**

TABLE 2

INPATIENT CLAIMS

Year	Model	Hospitalized Children (N)	Hospital Stays (N)	Average Hospital Stays per Child	Claims from Hospital Stays (N)	Average Claims per Hospital Stay	Average Payment per Claim ($)	Average Difference ($)	Kruskal-Wallis Test
2004	ppcp	56	368	6.6	865	2.4	640.2	-147.50	p<.0001 (hs)
2004	non ppcp	141	1,261	8.9	3,206	2.5	787.7		
2005	ppcp	71	390	5.5	757	1.9	687.3	-277.0	p<.0001 (hs)
2005	non ppcp	158	1,297	8.2	3,066	2.4	964.3		
2006	ppcp	74	373	5.0	1,304	3.5	686.1		
2006	non ppcp	178	1,979	11.1	6,260	3.2	667.1	18.9	p=.8300 (ns)
2007	ppcp	59	364	6.2	743	2.0	964.3	-44.4	p=.0084 (vs)
2007	non ppcp	176	1,655	9.4	3,641	2.2	1,008.6		
	ppcp	**260**	**1,495**	**5.8**	**3,669**	**2.5**	**2,978**	**-117.2**	
	non ppcp	**653**	**6,192**	**9.4**	**16,173**	**2.6**	**3,428**	**4.7**	
2004-7 difference				**-61.9%**		**-4.5%**	**-449.9**	**-112.5**	**p=.001 (vs)**

EMERGENCY CLAIMS

Year	Model	Children with ER Visits (N)	ER Visits (N)	Average ER Visits per Child	Claims from ER Visits (N)	Average Claims per ER Visit	Average Payment per Claim ($)	Average Difference ($)	Kruskal-Wallis Test
2004	ppcp	260	977	3.8	1,205	1.2	93.1		
2004	non ppcp	593	2,354	4.0	3,130	1.3	90.2	2.9	p .009 (vs)
2005	ppcp	304	1,289	4.2	1,724	1.3	91.3	-9.4	p=.0001 (vs)
2005	non ppcp	759	2,799	3.7	3,587	1.3	100.7		
2006	ppcp	362	1,456	4.0	2,407	1.7	83.2	-1.8	p .5655 (ns)
2006	non ppcp	880	3,536	4.0	5,825	1.6	84.9		
2007	ppcp	170	1,592	9.4	2,390	1.5	100.5	-2.5	p=.9902 (ns)
2007	non ppcp	1,205	4,184	3.5	3,983	1.0	103.0		
	ppcp	**1,096**	**5,314**	**5.3**	**7,726**	**1.4**	**368**	**-3.4**	
	non ppcp	**3,437**	**12,873**	**3.8**	**16,525**	**1.3**	**379**	**0.7**	
2004-7 difference				**41.2%**		**9.9%**	**-10.8**	**-2.7**	**p=.001 (vs)**

OUTPATIENT CLAIMS

Year	Model	Children with OP Visits (N)	Outpatient Visits (N)	Average OP Visits per Child	Claims from OP Visits (N)	Average Claims per OP Visit	Average Payment per Claim ($)	Average Difference ($)	Kruskal-Wallis Test
2004	ppcp	591	6,973	11.8	13,693	2.0	70.7	-1.3	p<.0001 (hs)
2004	non ppcp	1,587	16,358	10.3	38,255	2.3	72.0		
2005	ppcp	702	10,744	15.3	24,340	2.3	84.7		
2005	non ppcp	1,889	22,989	12.2	54,255	2.4	74.2	10.5	p<.0001 (hs)
2006	ppcp	766	11,945	15.6	31,573	2.6	72.6		
2006	non ppcp	2,102	26,851	12.8	72,876	2.7	70.3	2.2	p<.0001 (hs)
2007	ppcp	765	12,155	15.9	28,784	2.4	79.2		
2007	non ppcp	2,302	30,393	13.2	69,175	2.3	69.1	10.1	p<.0001 (hs)
	ppcp	**2,824**	**41,817**	**14.6**	**98,390**	**2.3**	**307**	**-0.3**	
	non ppcp	**7,880**	**96,591**	**12.1**	**234,561**	**2.4**	**286**	**5.7**	
2004-7 difference				**20.9%**		**-4.9%**	**21.6**	**5.4**	**p<.0001 (hs)**

(p<0.001). PPEP had higher EV per child and claims per EV starting in 2005. Also starting in 2005, PPEP paid claims were lower. Differences were statistically significant only for 2004 and 2005 (p<.001).

Discussion

Understanding to what extent models of care influence health care utilization in specific service settings, as well as cost, is essential to determine their public health value to populations not receiving their benefits. Previous studies identified cost reductions associated with lower IA and reduced length of stay when CSHCN were enrolled in a comprehensive primary care program.[8, 9]

In this study, average visits per child were higher and claims per visit were lower for PPEP. In addition, overall PPEP paid claims per visit for resource intensive services were lower (-$450 IA and -$11 EV) and higher for OV (+21%). These findings suggest that the PPEP model increases utilization of primary/preventive care and that a higher use of these services may decrease utilization of more costly services. Utilization and costs were lower for IA while utilization was higher and costs lower for EV. Use of outpatient services was mixed, as PPEP showed higher visits per child and lower claims per OV.

Different utilization patterns observed in the three service settings influenced model expenditures. Paid claims were used to estimate savings for participants in the standard care model if they had received PPEP care coordination. Participation in PPEP would have yielded a savings of $1,348,359 for each year of participation in this model.

This study has several limitations. The design did not control for disease severity and time of participation in each model of care. Some pediatric practices in Rhode Island may provide services with both PPEP care coordination and standard care. Some CSHCN receiving standard care and their families may have been exposed to the PPEP model. A mixed effects model was not considered in the research design. This factor along

with disease severity and follow-up time will be considered in a future study.

PPEP is Rhode Island's medical home initiative to enhance medical practices and coordination of care for CSHCN. In 2006, Rhode Island had the 2nd highest rate of CSHCN in the six New England states and the 6th highest rate among the 50 states and DC. [4] Study findings support an expansion of the PPEP model to practices with standard care along with the need to gather additional research evidence to inform this growth.

References

1. Newacheck PW, Strickland B, et al. An epidemiologic profile of children with special health care needs. *Pediatrics* 1998;102(1 pt 1):117–23.
2. Homer CJ, Klatka K, et al. A review of the evidence for the medical home for children with special health care needs. *Pediatrics* 2008; 122;e922-e37. http://pediatrics.aappublications.org/cgi/content/full/122/4/e922
3. US Department of Health and Human Services. Health Resources and Services Administration. Prevalence of CSHCN. http://mchb.hrsa.gov/cshcn05/NF/1prevalence/intro.htm
4. US Department of Health and Human Services. Health Resources and Services Administration. The National Survey of Children with Special Health Care Needs. Chartbook 2006-2007. http://mchb.hrsa.gov/cshcn05/SD/rhodeisland.htm
5. Farmer JE, Marien WE, et al. Primary care supports for children with chronic health conditions. *J Pediatr Psychol* 2004;29:355–67.
6. American Academy of Pediatrics, Ad Hoc Task Force on Definition of the Medical Home. The medical home. *Pediatrics* 1992;90:774.
7. The American Academy of Pediatrics. The National center for medical home initiatives. http://www.medicalhomeinfo.org/
8. Liptak GS, Burns CM, et al. Effects of providing comprehensive ambulatory services to children with chronic conditions. *Arch Pediatr Adolesc Med* 1998;152:1003–8.
9. Berman S, Rannie M, et al. Utilization and costs for children who have special health care needs and are enrolled in a hospital-based comprehensive primary care clinic. *Pediatrics* 2005; 115: e637-e42. http://pediatrics.aappublications.org/cgi/content/full/115/6/e637

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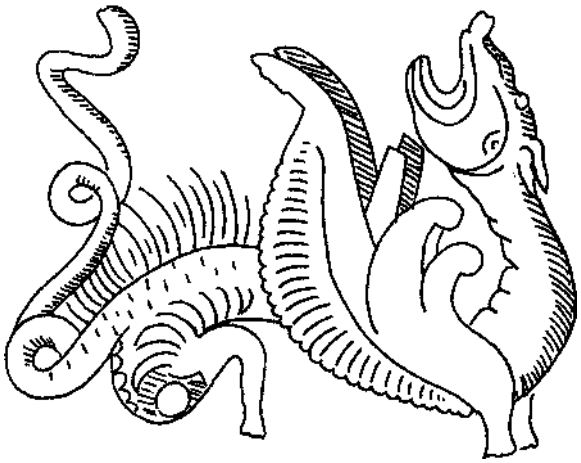


Geographic Access To Care In Rhode Island Through the Use of GIS

Rachel Popick, MPH, Arthur Frazzano, MD, MMS, and Robert Trachtenberg, MS

The Institute of Medicine (IOM) and the United States Department of Health and Human Services have pronounced improving access to care a public health priority.[1] The lack of a standard algorithm for measuring access to care, however, has impeded progress. In fact, there is still debate as to whether we are over- or under-producing doctors.[2,3]

In 1981 Penchansky and Thomas identified five dimensions of access: 1) availability, 2) accessibility, 3) affordability, 4) accommodation and 5) acceptability.[5] Two key components are geographic access and adequacy of the physician supply, traditionally measured through provider to population ratios.[4] Studies throughout the 1990s found that even when controlling for sociodemographic and socioeconomic factors, the provider-to-population ratios was a significant predictor of lower mortality from heart disease, cancer, and stroke. The ratios further predicted infant mortality, low birth weight, and poor self-reported health.[5]

Several states have used **Geographic Information Systems (GIS)** software to analyze access to health care and to inform policy decisions.[6] To date, GIS has not been used to assess access in Rhode Island.

In 2008, the Rhode Island AHEC (**Rhode Island Area Health Education Center**), at the Warren Alpert Medical School of Brown University, initiated the 2008 Primary Care Mapping Project. The project assessed provider to population ratios, enhanced by data on proximity to **Rhode Island Public Transit Authority (RIPTA)** bus lines.

Methods

The University of Rhode Island's Rhode Island Geographic System (http://www.edc.uri.edu/RIGIS/) provided data on the state; the Rhode Island Board of Medical Licensure and Discipline, a division of the Rhode Island Department of Health, provided data on health care providers, which included all licensed doctors and nurses in RI as well as their primary practice location and specialty. Physicians with primary practice locations outside RI were eliminated from the analysis. All primary practice locations in RI were mapped. Multiple addresses for physicians and practices were not included. While the use of only the primary practice address is a limitation of the project, the majority of secondary practice locations included hospitals and clinics; and we mapped hospitals and clinics in addition to the practices.

The data were broken down by towns and RI AHEC regions: Northern, Central and Southern. Some maps included municipalities. Other maps analyzed population density. Bus routes were incorporated into the data.

Nine maps depict the health care provider landscape in RI. (http://med.brown.edu/ahec/mapping_project.php)

Results

A total of 3,195 licensed physicians serve the 1,048,319 residents of the thirty-nine cities and towns in RI;[7] 1549 (48.5%) physicians are primary care providers, defined by the American Medical Association as internal medicine, family medicine, obstetrics and gynecology and pediatrics.[8] Of the primary care physicians, 256 are family practitioners (16.5%), 781 (50.5%) are internal medicine physicians, 338 (21.8%) are pediatricians, 174 (11.2%) are **obstetricians/gynecologists (OB/GYNs)**. The remaining 1610 physicians are specialists. (Table 1)

Physician Distribution by Region

Each of the three AHEC regions (Northern, Southern, Central) has a community office. The majority of physicians practice in the Central AHEC region. Clustering of providers around hospitals and medical facilities is prevalent in all regions, although most noticeable in the Central AHEC region due to the many hospitals and the physicians associated with the Warren Alpert Medical School (some do not provide direct patient care). Visual depiction of the providers in each town indicates shortages on the western border and certain areas around the northern and southern borders of the state. Although these areas are less populated than the Central AHEC region, there still exist too few providers to meet the needs

Table 1. Rhode Island Providers by Specialty

Specialty	Number of Licensed Physicians
Allergy and Immunology	8
Anesthesiology	124
Cardiology	67
Dermatology	55
Emergency Medicine	143
Endocrinology	7
Family Practice	256
Gastroenterology	41
Hematology	13
Infectious Disease	13
Internal Medicine	781
Medical Genetics	3
Nephrology	16
Neurology/Neurosurgery	87
No Reported Specialty	70
Nuclear Medicine	2
Obstetrics and Gynecology	174
Oncology	33
Opthalmology	72
Orthopedic Surgery	118
Osteopathic Manipulative Therapy	2
Otolaryngology	32
Pathology	84
Pediatrics	338
Physical Medicine and Rehabilitation	18
Plastic Surgery	19
Preventive Medicine	8
Psychiatry	257
Pulmonology	21
Radiology	127
Rheumatology	19
Surgery	143
Urology	44
Total	**3195**

of the individuals in each region. As a result we can assume that the catchment area in the greater Providence area extends across the whole state to account for the noticeable shortages along the state borders. (Figure 1)

Primary Care Physician to Population Ratios

The collective primary care provider to population ratio is 1:676. Statewide the ratio of primary care providers to patients is more than five times greater than the 1:3,500 cutoff, indicative of a **health professional shortage area (HPSA)**, as defined by the US Department of Health and Human Services Health Resources and Services Administration.[9] In the towns the primary care provider to population ratios range from 1:287 to 1:9,948. On average towns in Providence County have a higher provider to population ratio compared to towns in the northern and southern areas of the state; however, Providence County encompasses Glocester, which has the lowest patient to provider ratio. As expected, Providence has the highest number of licensed primary care physicians. The primary care provider to patient ratio there is highest: about one primary care doctor for every 276 patients.

Eight of the 39 (20.5%) towns in Rhode Island have provider to population ratios which qualify them at HPSAs. Four of these towns, Exeter, Foster, Richmond, and West Greenwich, had no providers at the time of data collection. This distribution of physicians may impede access to care outside of the greater Providence area. (Table 2 and Figure 2)

Proximity to Bus Lines

In addition to proximity to the patient's home, geographical access to primary heath care also depends upon ease of access or availability of transportation. **RIPTA** serves thirty-eight of the thirty-nine towns, with fifty-eight bus routes. Most routes are concentrated in the central AHEC region, around the Providence area. Public transportation is especially important for individuals who do not have cars. Accordingly, all but one medical facility (clinic or hospital) in RI is located on a bus line.

Access to primary care providers by public transportation is strong throughout the state. Within the Central region almost all primary care provider locations are directly on a bus line. Due to the frequency of stops it is hard to tell the proximity of the practice location to an actual RIPTA bus stop, but we assume that an individual without a car would be able to access any of the locations in this area. In the Northern and Southern AHEC regions, only three or four lines run into these regions. However, given the few bus lines in these areas, many providers have clustered around bus routes and more than half of the primary care physicians in the Northern and Southern region are located directly on a bus route. Despite proximity of primary care providers to bus lines in the Northern and Southern regions, access to providers using public transportation may be difficult. The scarcity of bus lines in the regions indicate that individuals likely rely on personal or shared vehicles for travel. (Figure 3)

Specialists in Rhode Island are not as closely distributed along bus lines as

Figure 1. Distribution of RI Primary Care Physicians by Towns and AHEC Regions

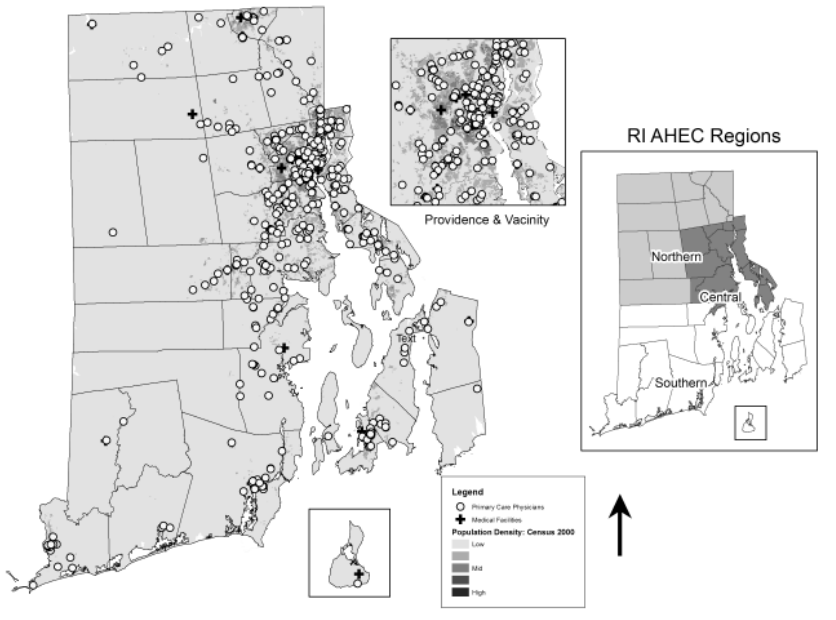


Table 2. Primary Care Provider to Population Ratio by RI Town and County

TOWN	RATIO
State of RI	**1:676**
Bristol County	**1:1205**
Barrington	1:840
Bristol	1:1321
Warren	1:2272
Kent County	**1:938**
Coventry	1:4809*
East Greenwich	1:287
Warwick	1:773
West Warwick	1:3286
West Greenwich	0**
Newport County	**1:1294**
Jamestown	1:2811
Little Compton	1:3593*
Middletown	1:1575
Newport	1:696
Portsmouth	1:1905
Tiverton	1:3052
Providence County	**1:556**
Burrillville	1:1579
Central Falls	1:2103
Cranston	1:808
Cumberland	1:1137
East Providence	1:676
Foster	0**
Glocester	1:9948*
Johnston	1:1174
Lincoln	1:5801*
North Providence	1:1117
North Smithfield	1:816
Pawtucket	1:623
Providence	1:276
Scituate	1:3441
Smithfield	1:1212
Woonsocket	1:1394
Washington County	**1:846**
Charlestown	1:1964
Exeter	0**
Hopkinton	1:979
Narragansett	1:1817
New Shoreham	1:505
North Kingstown	1:1316
Richmond	0**
South Kingstown	1:498
Westerly	1:488

*Meets criteria for HPSA
** Provider to population ratio could not be calculated

Figure 2: Primary Care Provider to Population Ratios across RI Towns

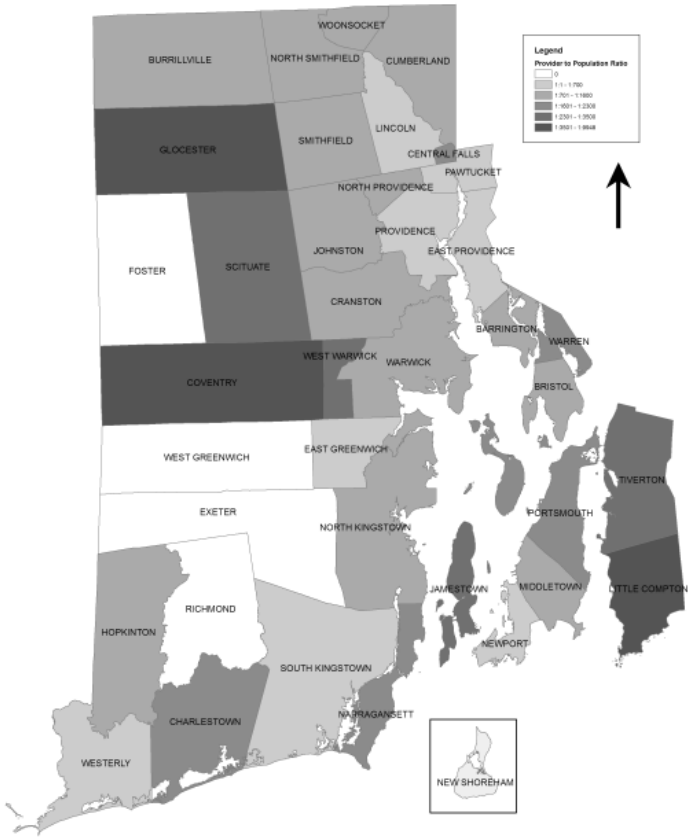
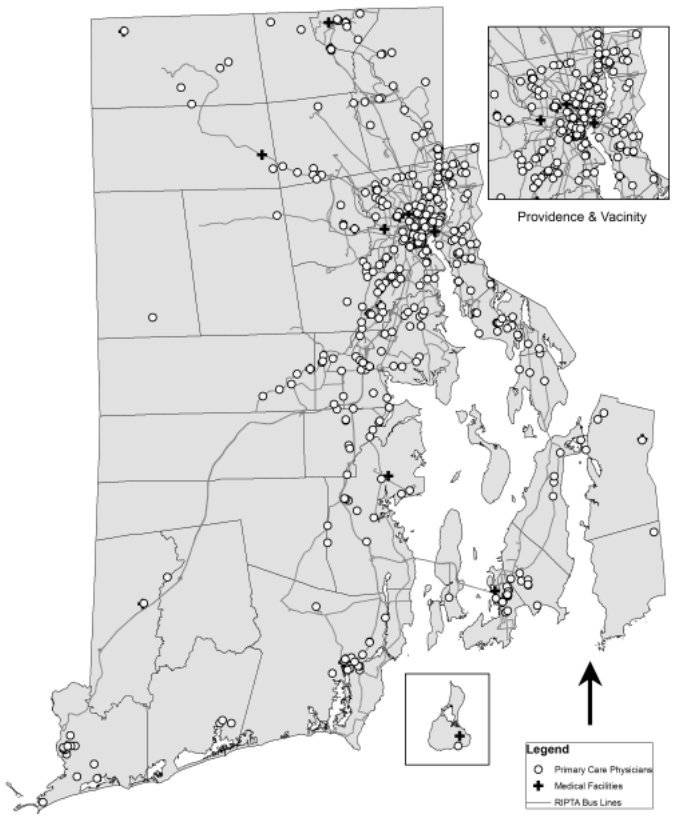


Figure 3: Primary Care Access: Proximity to RIPTA Bus Lines



primary care providers. The abundance of bus lines in the Central region allows for easy access to both primary and non-primary care physicians via public transportation. The scarcity of lines in the Northern and Southern regions has a greater impact on accessibility of non-primary care doctors. Further dispersal of non-primary care physicians leads to decreased proximity to bus lines and less ease of access. Despite challenges of accessibility via bus in the Northern and Southern regions, the majority of doctors across the state are located directly on a bus line and access assessed by proximity to a RIPTA bus line is sufficient on average.

Discussion

Access to health care in Rhode Island, measured by accessibility and availability, is generally strong across the state. However, the distribution of provider locations and scarcity of bus lines in the Northern and Southern regions point to challenges regarding primary care access, and the inconstancies of provider to population ratio by town highlight disparities in access. Currently the provider to population ratio for the state far exceeds the health professional shortage area criteria. However, we do not account for part-time practitioners with limited exposure to patient care or for the setting in which primary care providers work, such as hospitals with limited patient access. Twenty percent of towns meet the criteria for HPSA.

As mentioned in other primary care access papers, there are a sufficient number of providers but they are unevenly distributed based on the population. Because the population is most dense in Providence, an abundance of physicians in this area is necessary. However, there may be an over abundance in this area and a shortage in the peripheral regions. Consequently we can expect frequent travel into Providence to seek health care, impeding ease of access for the poor and the elderly. Future planning should attempt to incentivize doctors to practice in the underserved locations. RI AHEC's use of GIS is effective for visualizing large datasets and depicting access gaps for residents, health care professionals and leaders. Admittedly, the small size of RI may mitigate against serious maldistribution of care, but special attention should be given to the most vulnerable populations to achieve an equitable health care system.

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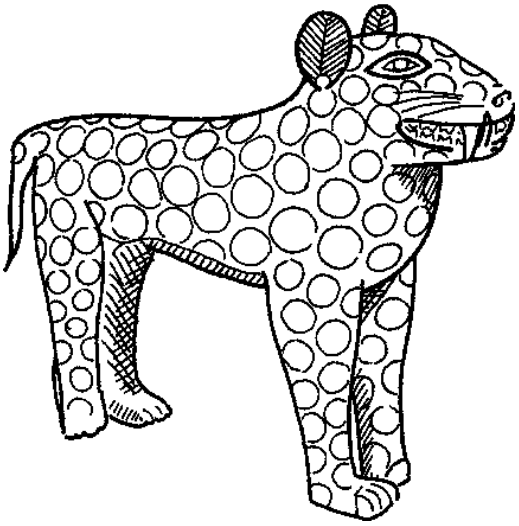
References

1. Graves BA. Integrative literature review. *Perspectives health information Managem* 2008;5.
2. Rosenthal MB, Zaslavsky A, Newhouse JP. The geographic

distribution of physicians revisited. *HSR: Health Services Res* 2005;40:1931-52.
3. McKinlay J, Marceau L. When there is no doctor. *Social Science Med* 2008; 67:1481-91.
4. Pechansky R. Thomas JW. The concept of access. *Med Care* 1981; 19: 127-40.
5. Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Millbank Quarter* 2005; 83: 457-502.
6. Fryer GF et al. Multi-method Assessment of Access to Primary Medical Care in Rural Colorado. J Rural Health 1999; 15: 113-21.
7. RIGIS. "US Census 2000 (SF1); Population & Housing Statewide" Ed. February 2007.
8. American Medical Association. Physicians in Primary Care and Sub-specialties by Gender. American Medical Association Master File. March 2000. http://www.ama-assn.org/ama/no-index/about-ama/2687.shtml
9. HRSA. Shortage Designations: HPSAs, MUAs, and MUPs. http://bhpr.hrsa.gov/shortage/primarycare.htm on February 15,2009.



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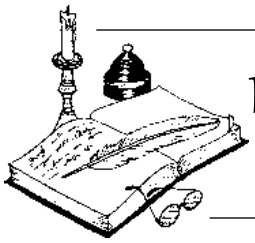
Disclosure of Financial Interests

The authors have no financial interests to disclose.



Physician's Lexicon

The Impermanency of Definitions

"When I use a word," Humpty Dumpty said, in a variously petulant and scornful tone, "it means what I choose it to mean—neither more nor less." The meanings of English words, from year to year, are not quite that capricious or mercurial; but the intended meanings of some common words can sometimes vary dramatically from one context to another. And knowledge of the etymology of such metastable words only adds to the confusion.

Consider the simple English word privy (from the Latin, *privus*, meaning singular or special). The cognate word, private, means roughly the same, something belonging to a single person. But closely related words—privative, privation or deprive—convey an opposing meaning denoting the *lack* of something, a sense of poverty. Contrariwise, a privilege (from the Latin, *privilegium,* meaning a regulation or law pertaining to an individual rather than a class or family of persons) defines something gained, something positive and generally sought after. The word, privy, can also define opposite things. In general, it denotes something private ("They are privy to certain state secrets") And a Privy Counsel (generally an advisory group for a sovereign) or a Privy Seal suggests gatherings or things associated with royalty. In contrast, a privy—uncapitalized—typically refers to a commode or a chamber pot. And even here its synonym, commode, may convey ambiguous meanings. A commode is usually a polite way of describing a privy or toilet but it can also define an ornamental cabinet; and when turned into an adjective, commodious, it describes something that is ample or spacious and clearly unconnected to bathrooms. And a commodity, from the same root (*commodus* in Latin, meaning suitable or convenient) is a noun meaning a product of some merit or value.

Yet another word that must be employed with care is the noun, prodigy, currently denoting one or more offspring, good, bad or indifferent (but generally suggesting a gifted offspring.) It is from the Latin, *prodigium* meaning a sign, a portent or an omen. But turn it into an adjective, prodigal, and we have an extravagant, profligate or wasteful son or daughter (cf. Luke 15: 11-32). Then we may encounter yet another adjective, prodigious, meaning extraordinary, marvelous or just wonderful.

The meanings and intents of words shift from decade to decade, sometimes even from season to season. To convey a sense that accurately reflects our intended meaning requires a sensitivity to contemporary language definitions and a judgment-free appreciation of the nuances, the subtle variations in expression, employed by the public. Comparative etymologists have suggested, with ample evidence, that words are much like flora and fauna in that they evolve accordingly to selective - Darwinian—pressures and through the process of natural selection.

– Stanley M. Aronson, MD

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Fifty Years Ago, July 1959

Leonid S. Snegireff, MD, Associate Professor of Cancer Control, Harvard Medical School, and co-author of "The Report of the US Public Health Mission to the USSR," contributed "Survival Medicine in the Soviet Union." He explained: "The Russian state and the Russian people are so organized that they can go from peace to war and war to peace with very little shift in their medical economy…All members of the medical services are basically capable and would think nothing of it if they were obliged, under certain circumstances, to drop the medical services in which they were participating and fill in in industry or in agriculture for a required period." He noted three classes of physicians: sub-professional "feldschers," rank and file gradates with a physician's diploma, and graduates with a degree in Medical Services. About 400 schools trained feldschers, analogous to America's corpsmen.

The Journal printed several presentations from the 148th annual meeting of the Rhode Island Medical Society.

John B. Blalock, MD, Kenneth Meyer, MD, and W.F.Dukes, MD, all from the Ochsner Clinic and Foundation Hospital, New Orleans, presented "Treatment of Thromboembolic Disease by Ligation of the Inferior Vena Cava."

Edwin B. Gammell, MD, Chief, Department of Otolaryngology, The Memorial Hospital, presented "The Obstructed Ear." He discussed the incidence of hearing deficits, as found in school hearing testing programs. In Pawtucket, of a school population of 15,204, a total of 8,002 children were tested; 405 showed hearing loss.

Joseph Song, MD, Herbert Fanger, MD, and Thomas H. Murphy, MD, presented "The Women's State Cytology Program: A Progress Report." The National Cancer Institute was researching the incidence of genital tract cancers in different age groups. In Rhode Island, 360 physicians and 10 clinics participated, collecting 2 smears (vaginal and cervical) from 25,000 women. The results showed 1.1% positive, and 84% negative. Biopsy was recommended in the 288 positive cases: 148 had cancer-in-situ; 28 had squamous cell cancer; 19 had adenocarcinoma of fundus; only 21 were negative. The authors concluded: "…cervical cone biopsy is not satisfactory as a therapeutic procedure since there were a considerable number of residual cancers…found in hysterectomy specimens."

An Editorial, "Been for a Walk Lately?" urged readers to resume the practice of walks, "not just to reach a destination, but for the pleasure and healthy exercise gained."

Twenty-Five Years Ago, July 1984

On The President's Page, Paul J.M. Healey, MD, marked the 9th anniversary of *Barry et al. v. St Paul, et al*, a lawsuit that eight Rhode Island physicians (including Dr. Healey) brought against St. Paul, Aetna, Traveler's, and Hartford Insurance Companies, after the unilateral withdrawal of the private insurance industry from the malpractice market in Rhode Island. The case was initially dismissed in US District Court in Providence, but on appeal (ultimately to the US Supreme Court), the physicians won. The Court "upheld the right of physicians to challenge these insurance grants in the highly complex area of antitrust law." In 1982, the physicians accepted $1.2 million settlement. But Dr. Healey asks: "Who won what?" The rates continued to rise; 600 cases were backlogged in the courts; one in 3 Rhode Island physicians was a defendant in a malpractice claim; and the "tort reform legislation of 1976 introduced by a gubernatorial malpractice commission has been declared unconstitutional."

This issue focused on Southeast Asian Refugees in Rhode Island.

An editorial explained that the state had welcomed 6600 Southeast Asian refugees, more than 1% of the total number of Southeast Asian refugees to this country. The Editorial also alerted physicians to a 24-hour interpreter service.

Lyn Kao August, MS, Consultant to the Office of Refugee Resettlement, Rhode Island, in "A Demographic and Health Profile," noted: "Progress is being made in establishing patient liaison services." She lauded the health of the population: "…the Southeast Asian group is not unhealthy….as they often are portrayed. Many of their health problems stem from a harsh life in tropical climates. They…have endured starvation, walked for days through jungle terrain, and swum across the Mekong Delta. The mere presence of the Southeast Asians in this country attests to their emotional and physical strength."

John Finck, MS, another Consultant to the Office of Refugee Resettlement, discussed "Cross-Cultural Issues in Medical Care," referring specifically to blood draining (refugees do not understand that the body replenishes blood that is drawn), medications for asymptomatic conditions, surgery (many refugees considered surgical scars as signs of diminished life), and autopsies (souls cannot be reborn in another body).

Youa Thao, Brown '84, a member of the '88 Brown-Dartmouth Program in Medical Education, discussed "The Hmong Perception of Illnesses," stressing refugees' reliance on shamanism and herbal medicine.

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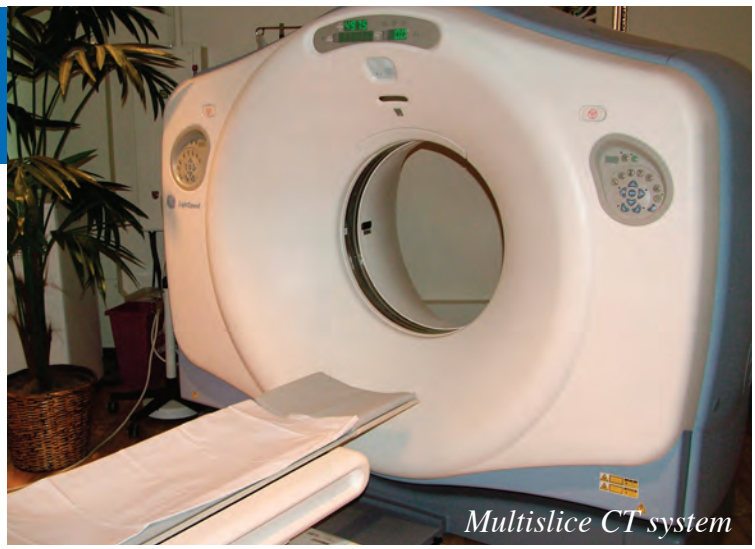
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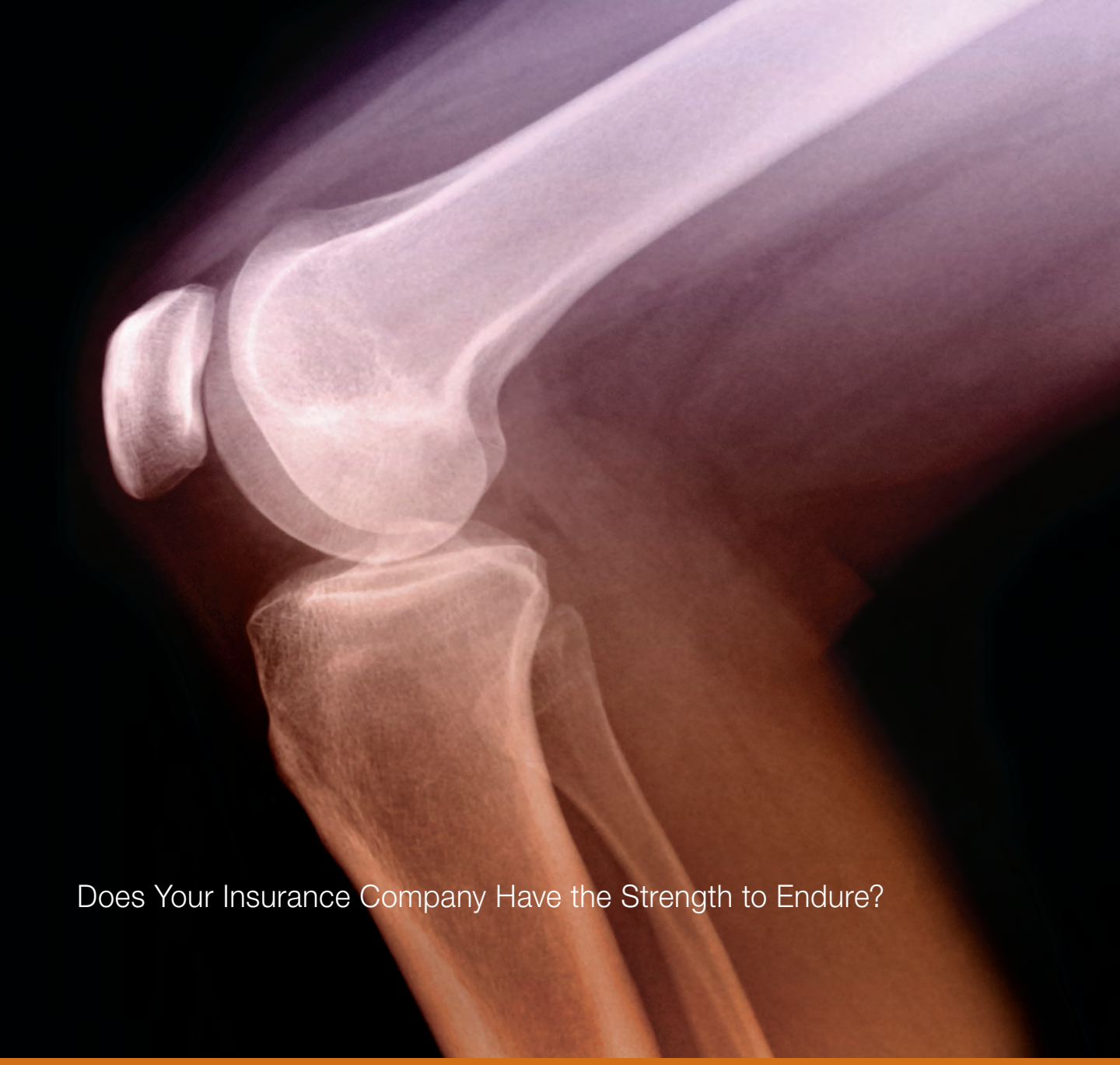

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