CAMBRIDGE PUBLIC HEALTH DEPARTMENT

Cambridge Health Alliance

TO: Robert W. Healy, City Manager

FROM: Claude-Alix Jacob, Chief Public Health Officer

DATE: June 2, 2010

SUBJECT: Response to Policy Order #6, adopted 4/26/10

Text of Order: That the City Manager be and hereby is requested to inquire of the Cambridge Public Health Department for statistics on the prevalence of Hepatitis B in Cambridge and suggestions on action the City of Cambridge can undertake to better manage the spread of chronic viral hepatitis and report back to the City Council; and be it further that the City Manager report back to the City Council on the feasibility of partnering with local institutions to conduct an annual HIV and Hepatitis Testing Day in the spirit of the free testing and counseling day offered in 2005.

Hepatitis B is a contagious liver disease that results from infection with the hepatitis B virus (HBV). Infection can result in a short-term illness (acute HBV) or serious, lifelong condition (chronic HBV). A small proportion of all people who experience acute HBV infection are unable to clear the virus from their bodies and develop the chronic form of the disease. Chronic HBV infection can result in long-term health problems, including liver damage, liver failure, liver cancer, or even death.[1]

The risk of developing chronic HBV after acute infection is highest in young children. According to the Centers for Disease Control and Prevention (CDC), hepatitis B becomes chronic in about 90% of infected infants; 25% to 50% of children age 1 to 5; and 5% of older children (age 5+) and adults.[2]

Reducing transmission of hepatitis B in the United States is challenging for several reasons, including:

1. Since the universal vaccination of infants was instituted in 1991, hepatitis B has become largely a disease imported into the U.S. by people from endemic countries. These individuals are typically unaware that they are hepatitis B carriers because they were infected at birth. They may not be tested because they encounter barriers to preventive or primary health care due to immigration or economic status.
2. The majority of people who develop chronic HBV after acute infection never experience symptoms of the disease (e.g., fatigue, jaundice). For instance, young children newly infected with HBV are typically asymptomatic, as well as 50% to 70% of older children (5 years or older) and adults, according to the CDC.[3] These individuals may be lifelong carriers of the hepatitis B virus—and thus can transmit the virus to others—but never become sick themselves. Or they might be asymptomatic most of their lives until the onset of cirrhosis, liver cancer or end-stage liver disease.[4]

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[1] "Hepatitis B Information for the Public," Centers for Disease Control and Prevention. Available at: www.cdc.gov/hepatitis/B/bFAQ.htm#overview.
[2] "Recommendations for Identification and Public Health Management of Persons with Chronic Hepatitis B Virus Infection," Morbidity and Mortality Weekly Report, Sept. 19, 2008, Centers for Disease Control and Prevention. Available at: http://www.cdc.gov/mmwr/pdf/rr/rr5708.pdf.
[3] Ibid.
[4] "Recommendations for Identification and Public Health Management of Persons with Chronic Hepatitis B Virus Infection," Morbidity and Mortality Weekly Report, Sept. 19, 2008, Centers for Disease Control and Prevention.

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3. Many people at risk for HBV or who are HBV-positive belong to hard-to-reach populations. These individuals often do not have access to preventive services and those who are positive often lack adequate access to testing services, social support, and case management services, according to a 2009 report by the Institute of Medicine.[5]
4. Due to lack of knowledge and awareness about chronic viral hepatitis, many health care providers do not screen people for risk factors and do not know how to manage infected people, according to the Institute of Medicine report. [6]

Who is at Risk for Hepatitis B?

Hepatitis B is transmitted by direct contact with blood, semen, or other body fluids from an infected person. This can happen through sexual contact or the sharing of needles (or other drug-injection equipment) or personal items that may have blood on them. In addition, pregnant women who are HBV-positive can pass the virus to their baby at birth. [7,8]

Those at greatest risk for contracting HBV include:[9,10]

- Immigrants, refugees, and adoptees from countries where hepatitis B is common.
- People who live with someone with chronic HBV.
- People who have multiple sex partners or have sex with infected individuals.
- Injection drug users.
- Men who have sex with men.
- Infants born to infected mothers.
- Travelers to countries and areas where hepatitis B is common.
- Workers exposed to blood on the job (e.g., hospital workers, police officers).
- People undergoing hemodialysis.

Data & Trends

In the United States, an estimated 800,000 to 1.4 million people are living with chronic HBV infection and every year, about 2,000 to 4,000 people die from HBV. [11]

Nationwide, the rate of new HBV infections has declined dramatically since 1985, which largely reflects of the widespread implementation of the hepatitis B vaccination.[12]

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[*] These are countries in which 2% or more of the population is HBV-positive.
[5] "Hepatitis and Liver Cancer: A National Strategy for Prevention and Control of Hepatitis B and C," Committee on the Prevention and Control of Viral Hepatitis Infections, Institute of Medicine, 2009. Available at: www.iom.edu/Reports/2010/Hepatitis-and-Liver-Cancer-A-National-Strategy-for-Prevention-and-Control-of-Hepatitis-B-and-C.aspx.
[6] Ibid.
[7] "Hepatitis B Information for the Public," Centers for Disease Control and Prevention.
[8] "Hepatitis B: Public Health Fact Sheet," Massachusetts Department of Public Health. Available at: http://www.mass.gov/Eeohhs2/docs/dph/cdc/factsheets/hepatitis_b.pdf.
[9] "Hepatitis B Information for the Public," Centers for Disease Control and Prevention.
[10] "Hepatitis B: Public Health Fact Sheet," Massachusetts Department of Public Health.
[11] "Recommendations for Identification and Public Health Management of Persons with Chronic Hepatitis B Virus Infection," Morbidity and Mortality Weekly Report, Sept. 19, 2008, Centers for Disease Control and Prevention.
[12] "Recommendations for Identification and Public Health Management of Persons with Chronic Hepatitis B Virus Infection," Morbidity and Mortality Weekly Report, Sept. 19, 2008, Centers for Disease Control and Prevention. Available at: www.cdc.gov/mmwr/pdf/rr/rr5708.pdf.

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U.S. populations that experience the burden of chronic HBV infections are immigrants from regions of the world in which HBV is widespread* and their close contacts, people with HIV/AIDS, injection drug users, and men who sex with men.[13]

Of these groups, immigrant populations shoulder the greatest burden of disease. The CDC estimates that foreign-born individuals represent 47% to 70% of all chronic HBV infections in the U.S. Regions of the world with intermediate or high prevalence of chronic HBV include much of Eastern Europe, Asia, Africa, the Middle East, and the Pacific Islands.[14]

Cambridge Data

Among Cambridge residents, an average of 25 confirmed HBV cases and 32 probable HBV cases were reported annually between 2005 and 2007 (Table 1). Specific case definitions for confirmed and probable cases are detailed in Table 2. The vast majority of these cases are chronic HBV infections, not newly acquired (or "acute") HBV infections.

Because many people with the chronic form of hepatitis B are asymptomatic, and health care providers do not routinely test for the virus, the exact number of Cambridge residents currently living with HBV (known as "prevalence") is unknown.

Table 1. Number of acute and chronic HBV cases among Cambridge residents by case status and year, 2005-2007

Year	Confirmed	Probable	TOTAL
2005	38	23	61
2006	17	32	49
2007	20	41	61
Annual Average for 2005–2007	**25**	**32**	**57**

Note: Data are current as of 5/7/2010. HBV case counts for a particular year can change retroactively, as more information becomes available.

Table 2. Definition of Case Status

CONFIRMED:	A confirmed case meets either of the following laboratory criteria for diagnosis: IgM antibodies to hepatitis B core antigen (anti-HBc) negative AND a positive result on one of the following tests: hepatitis B surface antigen (HBsAg), hepatitis B e antigen (HBeAg), or hepatitis B virus (HBV) DNA. OR HBsAg positive or HBV DNA positive or HBeAg positive two times at least 6 months apart (Any combination of these tests performed 6 months apart is acceptable.)
PROBABLE:	A case with a single HBsAg positive or HBV DNA positive or HBeAg positive lab result when no IgM anti-HBc results are available

Source: Centers for Disease Control and Prevention. Available at: www.cdc.gov/ncphi/disss/nndss/casedef/hepatitisbcurrent.htm.

[13] Ibid.
[14] Ibid.

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Hepatitis B Prevention Strategies

As with most infectious diseases, reducing the spread of HBV focuses on preventing new infections (primary prevention) and reducing the risk of transmission from infected individuals to their family and community (secondary prevention).

The most effective way to prevent new HBV infections is through vaccination. The CDC recommends hepatitis B vaccination for the following "at risk" groups:[15]

- All infants, starting with the first dose of hepatitis B vaccine at birth.
- All children and adolescents under age 19 who have not been vaccinated.
- People whose sex partners have hepatitis B.
- Sexually active individuals who are not in long-term, mutually monogamous relationships.
- People seeking evaluation or treatment for a sexually transmitted disease
- Men who have sexual contact with other men.
- People who share needles, syringes, or other drug-injection equipment.
- People who have close household contact with someone infected with the hepatitis B virus
- Healthcare and public safety workers at risk for exposure to blood or blood-contaminated body fluids on the job.
- People with end-stage renal disease, including predialysis, hemodialysis, peritoneal dialysis, and home dialysis patients.
- Residents and staff of facilities for developmentally disabled persons.
- Travelers to regions with moderate or high rates of Hepatitis B.
- People with chronic liver disease.
- People with HIV infection.
- Anyone who wishes to be protected from hepatitis B virus infection.

To identify the significant number of people who are HBV-positive, but unaware of their status, the CDC issued expanded guidelines for routine testing and follow up in 2008. The CDC currently recommends that the following populations be tested for hepatitis B and followed up with treatment and services, if needed:[16]

- People born in regions of the world in which the prevalence of hepatitis B is 2% or greater.
- People born in the U.S. who were not vaccinated as infants and whose parents were born in regions of the world in which the prevalence of hepatitis B is 8% or greater.
- Injection-drug users.
- Men who have sex with men.
- People with elevated ALT/AST of unknown etiology.
- People with certain medical conditions who require immunosuppressive therapy.
- Pregnant women.
- Infants born to HBV-positive mothers.
- Household contacts and sex partners of HBV-infected persons.

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[15] "Hepatitis B Information for the Public," Centers for Disease Control and Prevention.
[16] "Testing and Public Health Management of Persons with Chronic Hepatitis B Virus Infection," Hepatitis B for Healthcare Professionals, Centers for Disease Control and Prevention, 2008. Available at: www.cdc.gov/hepatitis/HBV/TestingChronic.htm.

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- People who are the source of blood or body fluid exposures that might warrant post-exposure prophylaxis (e.g., needlestick injury to a health care worker).
- People infected with HIV.

What is Cambridge Doing?

The Cambridge Public Health Department and local health care providers address hepatitis prevention and case management in the following ways:

Universal Vaccination of Children and Adolescents: In Massachusetts, completion of the hepatitis B vaccination series has been a requirement for day care entry since 1993, elementary school entry since 1996, and junior high entry since 1999.[17] According to current Massachusetts Department of Public Health regulations, all students attending Massachusetts preschools (offered through a public school system), and elementary, secondary, and postsecondary schools must be successfully vaccinated against hepatitis B prior to school entry.[18] In Cambridge, the public health department helps ensure that students in city-operated child care programs and the public school system are fully compliant with the state immunization requirements.

HBV Prevention for Newborns of HBV-Positive Mothers: The Massachusetts Department of Public Health (MDPH) is responsible for ensuring that pregnant women are screened for the hepatitis B virus and that newborns of HBV-positive mothers receive the prompt administration of vaccine and hepatitis B immune globulin after delivery. Through the state health department's electronic communicable disease reporting system, Cambridge receives notification of chronic HBV among pregnant Cambridge residents, as well as relevant case information, but does not participate in follow up investigations unless requested by state health officials.

HBV Prevention and Care for Other At-Risk or HBV-Positive Adults: With universal screening of pregnant women for HBV and the successful implementation hepatitis B vaccine requirements for school entry in the 1990s, HBV prevention efforts in the U.S. have shifted to "hard to reach" adult populations, such as immigrants from regions of the world in which HBV is common and their close contacts, men who have sex with men, and injection drug users.

In Cambridge, the public health community and local health care providers have become increasingly involved in identifying and facilitating treatment and follow up for members of these high-risk populations who may be at risk for HBV or who are already infected.

In 2007, the Cambridge Public Health Department's Public Health Nursing Program started a twice weekly vaccination clinic at the department at which at-risk individuals can receive free hepatitis, flu, and pneumonia vaccines, as well as tuberculosis skin testing. In 2008, as part of a public health practicum for Cambridge Health Alliance medical residents, participating residents worked with staff from CPHD and the CHA Department of Medicine on a two-year, grant-funded project, "Improving the Clinical and Public Health Management of Hepatitis B."

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[17] "Hepatitis B Prevention Mandates: Prenatal, Daycare, and K-12," Immunization Action Coalition, 2010. Available at: www.immunize.org/laws/hepb.asp.
[18] "Immunization of Students Before Admission to School," 105 CMR 220.000, Code of Massachusetts Regulations: Department of Public Health, last revised: January 2010. Available at: www.lawlib.state.ma.us/source/mass/cmr/cmrtext/105CMR220.pdf.

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As a result of this project, Cambridge Health Alliance:

- Hosted a grand rounds in March 2009 with Dr Daryl Lau from Boston Medical Center to educate internists on the new screening guidelines for hepatitis B.
- Has implemented a hepatitis B screening prompt ("Did you screen for hepatitis B?") in the "health maintenance" section of the electronic medical records for CHA patients, which encourages clinicians to offer HBV testing and counseling to at-risk patients.
- Has developed a hepatitis B "SmartSet" that will provide guidance to CHA clinicians on how to care for patients living with HBV. The software program addresses screening, counseling, transmission to close contacts, vaccination, treatment with antiviral medications, and referrals to appropriate medical specialists and the Cambridge Public Health Department. The HBV "SmartSet" was implemented in January 2010.
- Cambridge Health Alliance primary care providers needing additional follow up for chronic HBV patients will use a referral process via the CHA electronic medical record whereby a Cambridge public health nurse will receive referrals for further education, counseling, identification of contacts, and if needed, vaccination.
- Is currently in the process of training physicians about the HBV "SmartSet," standards for testing for HBV, and the new referral policy to CPHD.

In addition, Cambridge Cares About AIDS and the Cambridge Health Alliance offer services to people at risk for HIV, many of whom are also at risk for hepatitis A, B, and C:

- Cambridge Cares About AIDS (CCA) operates the Cambridge Needle Exchange Program, which provides injection drug users access to clean needles and a host of other services. Exchanging needles reduces clients' risk for hepatitis B and C, as well as HIV. About 100 people participate in this harm-reduction program on weekly basis, according the organization's website.[19] Clients of CCA at risk for HBV are counseled about risk reduction and vaccination of contacts. These individuals and their contacts also have access to (and may be referred to) CPHD for vaccination.
- Cambridge Health Alliance's HIV counseling and testing program, which operates in seven locations, including the Windsor Street Health Center, the East Cambridge Health Center, and at the Cambridge Hospital, refers patients at risk for hepatitis B to the health department (also located in the Windsor Street building) for vaccination.

Next Steps

Recognizing that chronic HBV is a serious public health issue affecting the City's immigrant populations, as well as other groups, the Cambridge Public Health Department plans to:

- Promote better understanding of HBV infection, transmission, prevention, and treatment in the at-risk and general populations.
- Increase testing rates among at-risk populations in Cambridge, with a particular focus on foreign-born residents from countries in which HBV is common.
- Work with Cambridge primary care providers to:
  - Increase screening, counseling, and vaccination of at-risk patients.
  - Improve completion rates of the hepatitis vaccine series in adults.

[19] "Needle Exchange Program," Cambridge Cares About AIDS. Available at: www.ccaa.org/needle_exchange.html.

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