UCLA
AAPI Nexus: Policy, Practice and Community

Title

The Role of the Patient-Centered Medical Home in Addressing Hepatitis B Perinatal Transmission: Charles B. Wang Community Health Center’s Hep B Moms Program

Permalink

https://escholarship.org/uc/item/7fr0f2pj

Journal

AAPI Nexus: Policy, Practice and Community, 12(1-2)

ISSN

1545-0317

Authors

Weerasinghe, Isha
Bannister, Nicole
Huang, Vivian
et al.

Publication Date

2014

DOI

10.17953/appc.12.1-2.u834q144071431h3

aapi nexus Vol. 12, No. 1 & 2 (Fall 2014): 140-160

Practitioners' Essay

The Role of the Patient-Centered Medical Home in Addressing Hepatitis B Perinatal Transmission:

Charles B. Wang Community Health Center's Hep B Moms Program

Isha Weerasinghe, Nicole Bannister, Vivian Huang,
Chari Cohen, Jeffrey Caballero, and Su Wang

Abstract

Chronic hepatitis B (CHB) is a serious liver disease caused by the hepatitis B virus (HBV). Each year, approximately twenty-five thousand infants are born to HBV-infected mothers, and one thousand newborns become infected (Barbosa et al., 2014; Ward, 2008). To prevent HBV perinatal transmission and facilitate care management, health centers should utilize a patient-centered medical home model that provides coordinated, comprehensive, and culturally appropriate services. One model is the Hep B Moms Program at Charles B. Wang Community Health Center in New York City.

Introduction

Chronic hepatitis B (CHB) is the most common and most serious viral liver infection in the world (Lok and McMahon, 2001). Caused by the hepatitis B virus (HBV), CHB can cause a lifelong infection that can lead to premature death from cirrhosis, liver failure and/or primary liver cancer (hepatocellular carcinoma [HCC]) in up to twenty-five percent of those chronically infected at a young age (Lok and McMahon, 2001).

In the United States, it is estimated that between 1.4 and 2 million individuals are chronically infected with HBV, with fifty percent of these infections occurring in Asian Americans and Pacific Islanders (AAPIs) (Cohen et al., 2008; Gish and Gadano, 2006;

Kowdley et al., 2012). In fact, CHB and associated liver cancer now represent the largest health disparity for AAPIs, with high infection rates and HCC rates that are ten to thirteen times higher compared to Caucasians (NCI, 2004; Asian Liver Center, 2013; Chao et al., 2004; Mast et al., 2005).

Perinatal HBV Infection

HBV is spread through sexual contact or direct contact with blood and infected bodily fluids. Worldwide, most transmission occurs perinatally or through exposure during early childhood, leading to high rates of chronic infection (CDC, 2012; Shepard et al., 2006). Perinatal HBV transmission is still an important infection route in the U.S., with approximately twenty-five thousand infants born to HBV-infected mothers and an estimated one thousand newborns becoming infected each year through vertical transmission (Barbosa et al., 2014; Ward, 2008). Of those infected at birth, ninety percent are likely to develop a chronic HBV infection, and fifteen to twenty-five percent may die prematurely of HBV-related disease, including HCC (Beasley et al., 1977; Margolis et al., 1995; Mast et al., 2005). The Advisory Committee on Immunization Practices (ACIP) and the American Congress of Obstetricians and Gynecologists (ACOG) recommend that all pregnant women in the U.S. be screened for HBV so that infants born to infected mothers can be protected against infection (CDC, 1988, Mast et al., 2005). The vaccination strategy for infants of HBV-infected mothers consists of giving them combined Hepatitis B Immune Globulin (HBIG) and HBV vaccination within twelve hours of birth. Without this intervention, these infants have up to a ninety percent chance of becoming infected (Mast et al., 2005; Tong et al., 2011). Following the first dose of hepatitis B vaccine (given at birth), a second and third dose are given, with the series being completed at six months of age. Between nine to eighteen months of age, postvaccination HBV serology tests confirm immunity, identify infants who need a second round of HBV vaccination, or identify HBV-infected infants.

This HBV prevention strategy hinges on the proper identification of infected women during pregnancy and at the delivery hospital. Because HBV tests are usually done early in pregnancy by the obstetrician, the information must be accurately relayed to the hospital (through paper chart, fax, or electronically), and an appropriate protocol at the hospital should be in place. Documentation also needs to be relayed to the pediatrician to make him or her aware that if the infant was at risk of HBV transmission, HBIG and HBV vaccines were received at the hospital, and the infant needs to have post vaccination HBV serology testing done to confirm immunity.

On a national scale, the HBV perinatal prevention strategy also includes universal HBV immunization for all infants born in the U.S. from 1991 (ACIP, 1991). As of 2012, the administration of the birth dose of the HBV vaccine while in the hospital (or by one month) became a quality measure by the National Quality Forum (NQF, 2012). The Centers for Disease Control and Prevention fund the national Perinatal Hepatitis B Prevention Program (PHBPP), which provides case management in all fifty states to help ensure that infants born to high-risk mothers receive appropriate prophylaxis at birth, complete their vaccine series, and receive postserologic testing to evaluate vaccine success. Under the PHBPP, approximately ninety-five percent of case-managed infants are not infected with HBV because of proper prophylaxis, with seventy-eight percent completing the vaccine series within one year of age (Smith et al., 2012). However, current estimates indicate that about fifty percent of infected pregnant women in the U.S. are not identified (Smith et al., 2012), meaning that half of infants born to infected mothers might not be receiving intervention to prevent them from becoming infected. Simultaneously, gaps exist regarding the administration of universal birth dose, with only about forty-six percent of infants born in the U.S. receiving the recommended birth dose by one day of age (CDC, 2009).

Some of the gaps in preventing perinatal HBV transmission include missed identification and reporting of infected pregnant women; loss of follow-up on pregnant women or infants; family refusal to participate; and lack of hospital policy or practice regarding HBV birth dose and postexposure prophylaxis protocols (IOM, 2010; Smith et al., 2012). Additionally, there are a number of socioeconomic, cultural, and environmental barriers that contribute to low screening and linkage to care among AAPI populations. Socioeconomic and cultural barriers include lack of information or misinformation about the disease; the lack of trust in one's physician; understanding how to navigate the U.S. health care system; language difficulties for limited English proficient (LEP) individuals affecting health access; limited time to coordinate visits due to work schedules; and fear of stigmatization and discrimination by family, friends, and community members (Cohen et al., 2009; Hu, 2008; Ma et al., 2007, 2008; Taylor et al., 2006; Thompson et al., 2002). Environmental barriers include lack of insurance or being underinsured (Cohen et al., 2009; IOM, 2010; Pollack et al., 2007). The tools are in place to prevent the vast majority of perinatal HBV infections, but these gaps must be addressed in order to eliminate mother-to-child transmission in the U.S.

The Patient-Centered Medical Home and Chronic Care Models

The patient-centered medical home (PCMH) was developed as a term to redefine primary care (Landon et al., 2010a; 2010b), focusing on care that is safe, timely, effective, efficient, equitable, patient-centered, family focused (National Partnership, 2014a), comprehensive, coordinated, and accessible (PCPCC, 2014). The Affordable Care Act (ACA) highlights the importance of primary care and the PCMH, stressing the necessity to bolster primary care in order to increase access to overall health care, to improve provider accountability and the patient-provider relationship, to improve patient satisfaction, and ultimately to reduce costs (Davis. Abrams, and Stremikis, 2011). In addition, through the Community Health Center Fund, the ACA provides community health centers with funding for infrastructure development, including primary health care services (Health Resources and Services Administration, 2013). Including the PCMH model within the primary care framework provides federally qualified health centers (FQHCs) with the optimal opportunity to improve efficiency and reduce costs.

The goals of the PCMH include increasing communication and efficiency, reducing duplicative efforts, and decreasing costs to the system (Wong et al., 2012), all of which are steps toward reducing health disparities (Wong et al., 2012; National Partnership, 2014b) and improving health outcomes (Kumar et al., 2010). The National Committee for Quality Assurance (NCQA), in an effort to accredit and evaluate PCMH development, created nine standards by which each PCMH must adhere to in 2009, which were updated and revised as six standards in 2014 (NCQA, 2014).[1]

For a PCMH site which seeks to provide adequate and effective hepatitis B services, coordination of care must occur across all points of health access to the mother and baby; this includes the primary care physician or hepatitis B provider, obstetrician or midwife, delivery hospital, infant's pediatrician, and the local health department.

Another model of care is the Chronic Care Model (CCM). In 1996, Improving Chronic Illness Care, a national program of the Robert Wood Johnson Foundation, developed the CCM. The purpose of the CCM is to promote improved outcomes in chronic care through integrated services, in response to evidence that showed deficiencies in the way chronic care was structured and delivered (including lack of guidelines, coordination, and care management) (RWJF, 2014). In a primary care system, research indicates that large numbers of individuals with chronic illnesses have inadequate disease control, poor disease outcomes, and are unhappy with their care (Wagner, 1998). The CCM was developed to address these issues by focusing on designing and delivering planned, proactive, and patient-centered chronic care (Glasgow et al., 2005). Its aims are to improve patients' capability to be self-managers, and includes six dimensions: organization of health care, clinical information systems, delivery system design, decision support, self-management support, and community resources.

Both models involve making system-wide changes that ensure health care accessibility to patients as well as utilizing electronic health records and resources to better track and follow through with the standard of care. They also highlight the importance of an engaged patient by recognizing barriers in language and education, emphasizing self-management, assisting the patient with the coordination of his/her own care by increasing the attention to transitions of care (such as post hospitalization), and making efforts toward routine medication reconciliation.

The Hep B Moms Program at the Charles B. Wang Community Health Center

The Charles B. Wang Community Health Center (CBWCHC) is an FQHC that has been providing high-quality, accessible, and culturally appropriate health and support services to medically underserved Asian Americans in the New York metropolitan area for more than forty years. CBWCHC was given a Level Three PCMH designation by the NCQA in 2010. The PCMH recognition demonstrates the Health Center's ability and commitment to provide comprehensive and coordinated care to its patients.

CBWCHC has a long history of providing hepatitis B screening, vaccination, and care. The majority of the Health Center's patients are from countries that have high and intermediate HBV prevalence, such as China, Malaysia, Vietnam, and Taiwan. The Health Center routinely screens all of their patients for HBV, and since 2004, CBWCHC has cared for more than 7,200 patients with CHB. In 2013 alone, one in eight adult CBWCHC patients was chronically infected with HBV, and there were over 3,200 adult CHB patients actively in care. The burden of CHB in the CBWCHC patient population is extremely high and disproportionate to national estimates stating that one in twelve Asian Americans has CHB (CDC, 2013). In addition, fifteen percent of CBWCHC's pregnant patients have CHB. With the high prevalence of CHB seen in pregnant women, preventing perinatal infection is a cornerstone in preventing overall CHB infection in the patient population.

The Hep B Moms Program evolved from a number of observations from the care of pregnant women with CHB at the Health Center. Although versed in the evaluation and care of adult CHB patients, several of the internal medicine (IM) providers were not comfortable in caring for pregnant women with CHB. Therefore, many patients were referred to an outside specialist, but many were lost to follow-up. Some of the cited reasons included cost, lack of insurance, availability of specialists, unfamiliarity with the specialist/office, and inconvenience. Even when the specialist evaluated the patient, occasionally patients did not fill their prescriptions or continue to go for follow-up monitoring visits. A case review of five HBV-infected infants at CBWCHC identified additional gaps in preventing HBV transmission, including failure of the delivery hospital to properly identify the mother as HBV-infected and thus not administering HBIG and HBV vaccines to the infant at birth, no documented completion of the HBV vaccine series, or failure to provide a timely post vaccination serology test.

To address these gaps in care, CBWCHC in 2010 created the Hep B Moms Program with the aim to prevent perinatal transmission of HBV. The program ensured that infants born to infected women received the recommended prophylactic treatment at birth and that HBV-infected pregnant women received proper care management. The Hep B Moms Program highlights principles from both the PCMH model and CCM by using a disease registry and electronic medical records (EMR) to track mothers and their infants, emphasizing patient engagement and empowerment through self-management tools, improving access through linguistic and cultural competency, and providing individual care coordination (Figure 1).

Figure 1. The Chronic Care Model in Hepatitis B Moms Program: Health System Improvements

Health System
Charles B. Wang Community Health Center's
Hepatitis B Moms Program

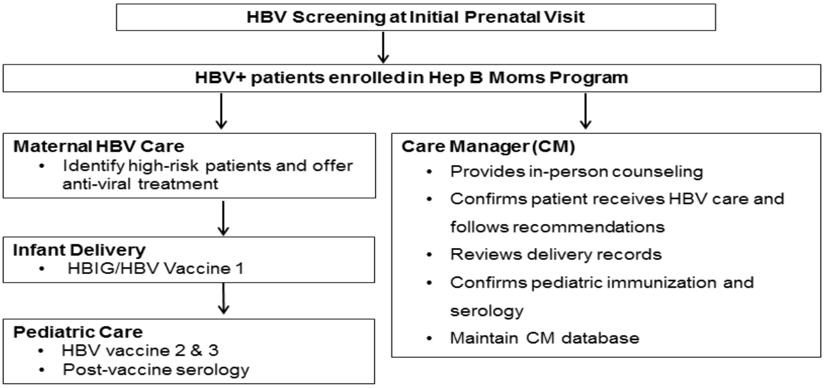
Delivery System Design	Decision Support	Clinical Information Systems	Self-Management Support
Hepatitis B Collaborative Care Team (multidiscplinary and meets monthly) Hepatitis B Care Manager (counsels mother, tracks patient visits, and tracks care between obstetrics, internal medicine, and pediatrics)	Provider training (on current management guidelines) Refer mothers to internal medicine for further HBV evalutation EMR includes HBV forms, flowsheets, group HBV tests, and HBV reminders	Within EMR: HBV specific flow sheets, test reminders, and CHB registry Hepatitis B Perinatal Database to track visits, blood work, treatment, infant vaccination, and serology test	One-on-one counseling Bilingual brochures: "Hepatitis B Moms Roadmap," "Protecting Your Baby from Hepatitis B," "Patient Tracker Card," "Hepatitis B Facts Everyone Needs to Know"

Delivery System Design

As a way to coordinate the delivery system, CBWCHC created the Hepatitis B Collaborative Care Team consisting of the hepatitis B program director, hepatitis B program coordinator, hepatitis B care manager (HBCM), chief medical officer, chief of obstetrics, a pediatrician, head nurse, head front desk manager, and a clinical informatics analyst. The multidisciplinary care team meets monthly to discuss the cohort of pregnant women with CHB and their infants, reviewing clinical indicators and care management measures (such as compliance with visits and vaccination recommendations), any barriers to care or management identified by any members, and potential improvements in the delivery of care to the mothers and infants.

The HBCM works with the obstetrics team to identify all pregnant women with CHB infection (HBV screening tests are done at the first prenatal visit), and they are added to the Hepatitis B Perinatal Care Database. The HBCM provides extensive case management, which continues throughout the pregnancy and into the infant's first year (Figure 2). The care management begins with a face-to-face counseling session with the pregnant mother. This is usually done while she is at the Health Center for a routine provider visit so as to not require an additional appointment. During the counseling sessions, patients are given educational materials and strongly advised to double-check at the time of delivery that their infants receive both injections at the hospital and to voice their concerns if the injections not completed. If a patient feels that she cannot communicate, often due to LEP, she is encouraged to use the Hep B Moms Program brochures to inform the delivery staff. In addition, all CBWCHC obstetrics patients are given and asked to carry a "Pregnancy Passport" at all times, which documents important screening tests related to their pregnancy, such as their HBV status. The "Pregnancy Passport" is crucial if the patient goes into premature labor and her records have not been received by the hospital, or if she shows up to a different hospital where her records have not been sent.

Figure 2. Hepatitis B Moms Program Workflow



After delivery, the HBCM reviews labor and delivery records to verify that the HBIG and HBV vaccines were given. Within the EMR, the infant's name and medical record number are entered into the mother's chart so that he or she can be tracked. After the patient delivers, the HBCM schedules her for postpartum HBV follow-up one to two months after delivery. If the infant also has a CBWCHC pediatrician, the HBCM documents that vaccination has been completed along with a postvaccination serology test. However, because some infants are sent to China (to be cared for by family members) at three to four months of age and often do not return until they are of preschool age, these children often miss the recommended six-month vaccination dose. To reconcile the inability to track these children directly, the HBCM tries to obtain the information from the mothers when they return to the Health Center for care, although this is often challenging.

Decision Support

CBWCHC believes that they have a role to provide education and support, and to equip physicians to deliver high-quality, clinically appropriate, coordinated care in this unique group of patients. A protocol is now in place so that when a pregnant woman is identified as HBV-infected during her obstetrics visit, an appointment is scheduled with an IM provider at CBWCHC for further HBV evaluation rather than an outside specialist. This protocol decreases the number of incomplete evaluations from external referrals, allows for closer care management, and standardizes the clinical care of the chronically HBV-infected pregnant woman. As part of the Hep B Moms Program, IM providers are trained on managing pregnant women with CHB, identifying those at higher risk of transmitting HBV to their infants, and learning how to effectively reduce transmission with antivirals in the last trimester. Specialists in the field regularly come to the Health Center to give talks on current management guidelines and to share their experiences with caring for pregnant women with CHB. Additionally, care management protocols are incorporated into the EMR system through HBV tailored forms, flow sheets, batch lab test order forms, and reminders. Physicians now routinely evaluate CHB-infected pregnant women as they would their nonpregnant CHB patients. The vast majority of pregnancies can be followed at CBWCHC, but for complicated cases, or if the provider or patient wishes, referrals to specialists are made.

Clinical Information Systems

Since 2006, CBWCHC has been using an EMR system. This has allowed for better population health management by way of test reminders, HBV specific flow sheets to track lab results longitudinally, and the creation of a patient registry. The pregnant patients with CHB are registered in an additional Hepatitis B Perinatal Database so that the HBCM can more closely monitor their care. The HBCM uses the database to improve case management, generate program statistics for monthly Hepatitis B Collaborative Care Team meetings, identify gaps in care, and provide feedback to the team.

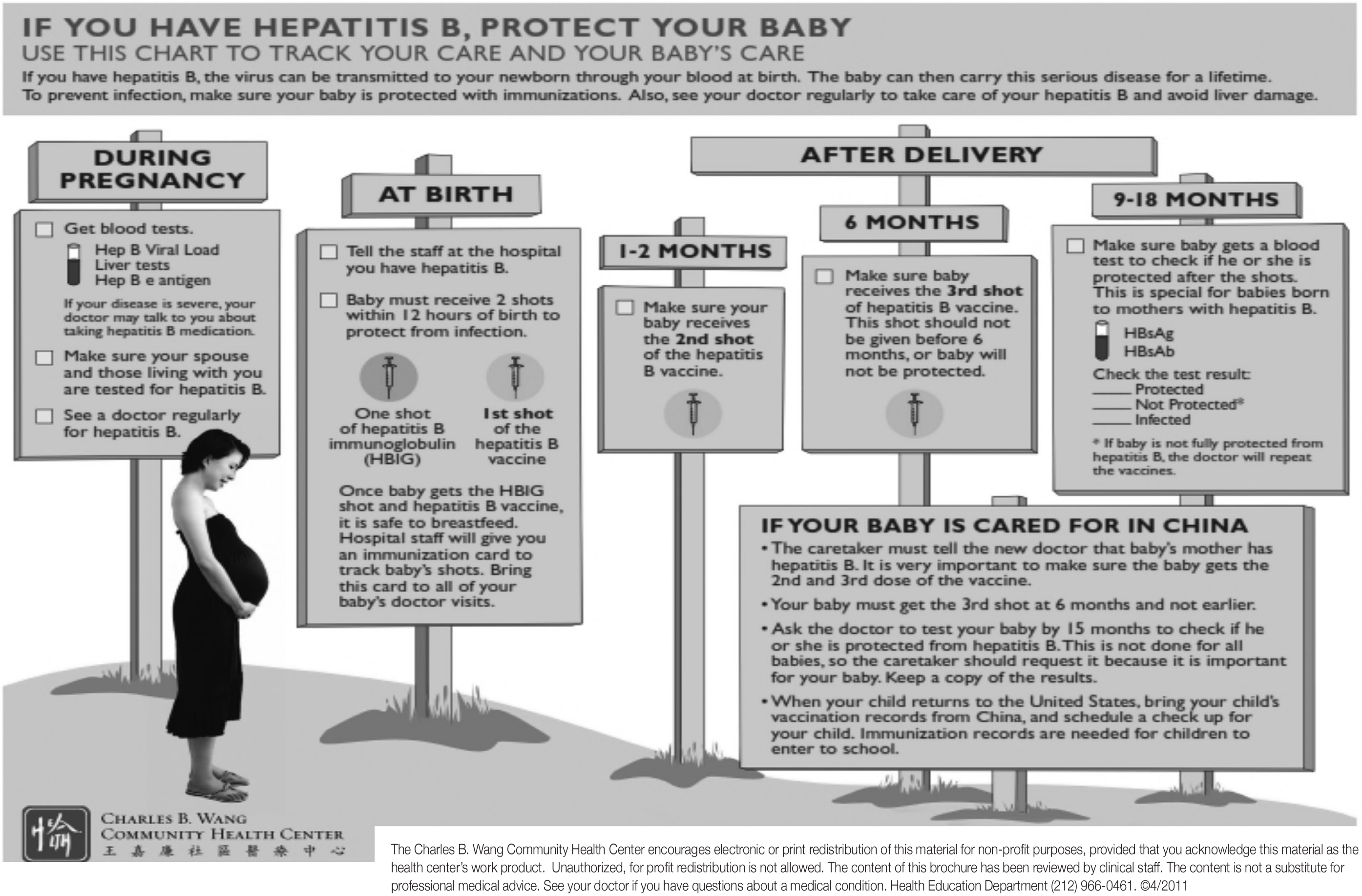
Self-Management Support

Both the PCMH and CCM emphasize patient education and engagement. The Health Center created the following four bilingual education materials, which provide information on CHB and can also be used as tools for self-care and care for their infants:

1. "Hepatitis B Moms Roadmap" (Figure 3) details on a timeline the CHB care the mother needs during and after pregnancy, as well as the vaccines and tests needed for her infant. The roadmap has checklists, a place to document the infant's test results, and is translated into English, Simplified, and Traditional Chinese;
2. "Protecting Your Baby from Hepatitis B" brochure details the information provided in the Hepatitis B Moms Roadmap;
3. "Patient Tracker Card," a bilingual pocket medical record for all CHB patients, is filled out with a patient's lab test results at each primary care visit and also serves as an educational tool. The patients bring this card to every primary care visit so they can track their own CHB clinical status; and
4. "Hepatitis B: Facts Everyone Needs to Know," is given to all patients who have CHB, household contacts of CHB patients, or anyone interested in learning about the topic. The brochure provides basic HBV information and also dispels myths and stigma surrounding HBV.

In the case of perinatal HBV transmission, it is crucial for the mother to be an advocate for herself and her child. The individual counseling provided to the mother and the "Hepatitis B Moms Roadmap" seek to empower her to take charge of her own health, to follow recommendations to get CHB care for herself during pregnancy, to be an advocate in the hospital and make sure her infant gets HBIG and HBV vaccinations within twelve hours of birth, and to ensure that her infant completes the vaccine series and receives the postvaccination serology testing within the recommended

Figure 3. Hepatitis B Moms Roadmap



IF YOU HAVE HEPATITIS B, PROTECT YOUR BABY

USE THIS CHART TO TRACK YOUR CARE AND YOUR BABY'S CARE

If you have hepatitis B, the virus can be transmitted to your newborn through your blood at birth. The baby can then carry this serious disease for a lifetime. To prevent infection, make sure your baby is protected with immunizations. Also, see your doctor regularly to take care of your hepatitis B and avoid liver damage.

DURING PREGNANCY

☐ Get blood tests.
  - Hep B Viral Load
  - Liver tests
  - Hep B e antigen

If your disease is severe, your doctor may talk to you about taking hepatitis B medication.

☐ Make sure your spouse and those living with you are tested for hepatitis B.

☐ See a doctor regularly for hepatitis B.

AT BIRTH

☐ Tell the staff at the hospital you have hepatitis B.

☐ Baby must receive 2 shots within 12 hours of birth to protect from infection.

One shot of hepatitis B immunoglobulin (HBIG)

1st shot of the hepatitis B vaccine

Once baby gets the HBIG shot and hepatitis B vaccine, it is safe to breastfeed. Hospital staff will give you an immunization card to track baby's shots. Bring this card to all of your baby's doctor visits.

AFTER DELIVERY

1-2 MONTHS

☐ Make sure your baby receives the **2nd shot** of the hepatitis B vaccine.

6 MONTHS

☐ Make sure baby receives the **3rd shot** of hepatitis B vaccine. This shot should not be given before 6 months, or baby will not be protected.

9-18 MONTHS

☐ Make sure baby gets a blood test to check if he or she is protected after the shots. This is special for babies born to mothers with hepatitis B.
  - HBsAg
  - HBsAb

Check the test result:
_____ Protected
_____ Not Protected*
_____ Infected

* If baby is not fully protected from hepatitis B, the doctor will repeat the vaccines.

IF YOUR BABY IS CARED FOR IN CHINA

- The caretaker must tell the new doctor that baby's mother has hepatitis B. It is very important to make sure the baby gets the 2nd and 3rd dose of the vaccine.
- Your baby must get the 3rd shot at 6 months and not earlier.
- Ask the doctor to test your baby by 15 months to check if he or she is protected from hepatitis B. This is not done for all babies, so the caretaker should request it because it is important for your baby. Keep a copy of the results.
- When your child returns to the United States, bring your child's vaccination records from China, and schedule a check up for your child. Immunization records are needed for children to enter to school.

CHARLES B. WANG
COMMUNITY HEALTH CENTER
王嘉廉社區醫療中心

Source: Charles B. Wang Community Health Center, 2010-Health Education (www.cbwchc.org)
http://www.cbwchc.org/hematerials/docs/If%20you%20have%20hep%20b_Eng.pdf

timeframe. When the mother is an active advocate, she provides additional oversight to an often disjointed health care system.

Health Care Organization and Community Linkages

As an organization, CBWCHC is committed to reducing HBV disparities and associated morbidity in its patient population. The support from the CBWCHC administration was crucial for the formation and continuation of the Hep B Moms Program.

Additionally, strong linkages to other organizations have been vital to the success of the Hep B Moms Program. This includes partnerships with the NYC Department of Health and Mental Hygiene (NYC DOHMH) and their PHBPP, which monitors perinatal HBV transmission prevention on a citywide level. The Health Center has served for many years as one of the two referral sites in NYC that screens and vaccinates susceptible household contacts of pregnant women with CHB as identified by the NYC DOHMH. CBWCHC has also developed strong relationships with local delivery hospitals to ensure that pregnant women with CHB are properly identified upon admission and that their infants receive HBIG and HBV vaccines within twelve hours of birth.

To facilitate information exchange between the delivery hospital and the pediatrician, CBWCHC began a pilot project to provide the hospital with a sticker for the infant's immunization card, identifying the infant is at risk of HBV perinatal exposure, documenting administration of HBIG, and providing a place for the pediatrician to document the postvaccination serology results (Figure 4). This is important information that can be lost if the labor and delivery records are not received by the pediatrician. In addition, many Chinese mothers observe a traditional postpartum period where they do not leave the house for one month. During this time, the father often will accompany the child to the pediatric visit rather than the mother and may not relay the information about the mother's HBV status or the infant's vaccinations to the provider.

All of these tools have proven to be effective with CBWCHC's patient population and are the results of trial and error. The tools, along with the cohesive and streamlined infrastructure in place because of the Hep B Moms program, help to ensure that HBV patient care from mother to infant will not be overlooked. Prior to 2010, at CBWCHC there were five known HBV-infected infants.

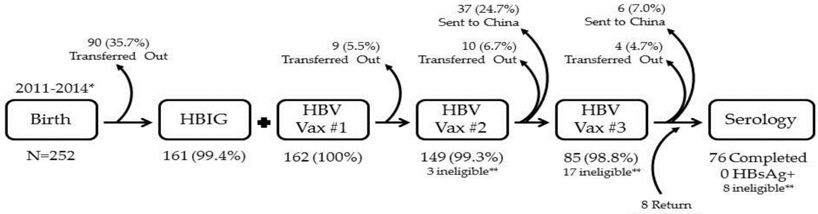
Figure 4. CBWCHC Created a Hepatitis B Sticker for the Infant'’s Immunization Card

Tetanus Diphtheria	DATE	
	SIGNATURE	
Influenza (Flu)	DATE GIVEN	
	SIGNATURE	
Influenza (Flu)	DATE GIVEN	
	SIGNATURE	

Hepatitis B Perinatal Exposure	HBIG (at birth)	Date Given	9/30/12
		Signature	
	Post-Vaccination Test Result (9-18 mos)	Date Tested	
		HBsAg (circle)	+ −
		HBsAb (circle)	+ −

Record each component of combined vaccines in all appropriate boxes

Figure 5. CBWCHC Infant Follow-Up: Hepatitis B Vaccine (Vax) Completion and Serology



* January 1, 2011—June 30, 2014.

** Ineligible because the infant is not yet old enough to receive the vaccine or serology test based on ACIP recommendations (Mast et al, 2005).

Data analysis from January 1, 2011 to June 20, 2014 shows no HBV-infected infants have been identified from CBWCHC-followed infants born to mothers in the Hep B Moms program (Figure 5).

Implementing the PCMH in the Context of Prenatal Hepatitis B Services:

Policy Discussion

The Hep B Moms Program is a best practice for coordinated care for HBV management and can be used as a model for other disease states. In particular, the care manager and emphasis on patient engagement may be particularly important for patients who face barriers to care in the form of language, education, or access issues. These barriers can impact health care outcomes negatively. The PCMH and CCM seek to alleviate these by improving the communication and coordination of care between the patient, providers, and institutions, highlighting care management, and emphasizing patient self-management. Hard-to-reach, LEP populations can greatly benefit from these health home models, as all points of care, from prenatal care to the care of the child, are addressed.

The accurate transfer of patient information between providers in different settings is essential to ensure the continuity of care. However, this is still an elusive goal in the current health care environment. Breaks in communication lead to duplicate tests and missed diagnoses, which result in less efficiency, and therefore, more opportunity for general costs to the system. Ultimately, this compromises a patient's quality of care. Transferring information electronically in a streamlined fashion can help to alleviate these issues, such as diagnosis errors (e.g., recording HBV-negative status for an infant who is HBV-positive).

Thankfully, there are increased efforts to improve the exchange of health information and transition of care. On a federal scale, the Health Resources and Services Administration (HRSA) introduced an initiative in 2011 to encourage FQHCs to attain medical home recognition. The Centers for Medicaid and Medicare Services (CMS) and other insurers also started to acknowledge the positive benefits of the medical home model in 2011, working with HRSA and rewarding medical homes in different ways (e.g., with monthly management fees for each Medicare beneficiary). In addition to the PCMH, CMS' Meaningful Use Incentive program sets the standards for EMR use by vendors and providers to improve patient care. Measures require successful electronic exchange between providers. Although more improvement in the EMR system and recognition of the nuances of how EMRs should reflect unique patient populations are necessary, important first steps have been made.

The infrastructure created to coordinate care within the Hep B Moms Program with databases and registries, a dedicated case manager, self-management tools, and monthly meetings was created to help compensate for a disjointed health care system. A seamless transfer of information would alleviate much legwork, and CBWCHC would not have to teach their patients to carry around the "Patient Passport" and "Hepatitis B Roadmap." Although patient engagement and care management are important as standalone principles, they should not have to be used to bridge the gap between providers.

When addressing chronic illnesses like HBV in patients who face multiple barriers in accessing health care, with a sometimes difficult to reach, LEP population that has multiple barriers in accessing health care, attention must be paid to the specific needs of the target community. Similar to the Hep B Moms Program created at the CBWCHC, the PCMH, or health home, must be built to reflect the needs of the community in question. It must also accommodate the changing demographic of the population served by, in this case, a community health center (Wong et al., 2012). Coordinated, patient-centered, and linguistically and culturally competent prenatal care within a trusted facility such as a community health center can make a difference in changing a mother's behavior, encouraging her to take charge of her health, and the health of her baby and family (Wong et al., 2012). This is a crucial step in reducing HBV prevalence rates and addressing the management of CHB within a family comprehensively. The new NCQA standards for the PCMH were released in 2014. The new standards attempt to streamline the PCMH, incentivizing communication channels between provider and patient in and outside of traditional "office hours," providing the patient with more accountability, and building the aspects of the patient–provider–health facility relationship that will optimally lead to increased trust (NCQA, 2014). As hoped, the new standards reflect a cognizance of the diversity within a patient population, paying special attention to cultural and linguistic needs. As providers have different cultural, linguistic, and professional skills, policy changes need to happen at the state and federal levels in order to provide support for these providers to be able to integrate their services within the health home (Moses and Ensslin, 2014). In addition, NCQA places a focus on integrating behavioral health as well as more accurate and robust data collection and monitoring in its efforts to impact future programs.

Care management of complex conditions or behavioral health, focusing on the social determinants of health and other outside factors of the health system that could influence the patient, are all mentioned within the NCQA 2014 standards. Hepatitis B is a complex disease state that affects a number of different demographics within a health center context and can be a good candidate to address within the PCMH. Perinatal HBV care highlights the importance of information exchange and coordinated care. It requires providers to act as the members of a relay race, where the baton must be passed with precision without being dropped. Health care entities must gauge their success, not only in how they care for patients within their facility but with all of the entities involved in a patient's health. Health centers should apply their unique ability to provide coordinated care to create health homes for high-risk patients, such as those with HBV. Best practices like CBWCHC's HBV CCM can be adapted within a center's practice setting to care for their patient population with HBV. When medical homes have the capability to help patients successfully navigate health system complexities, patients can experience the true integration of comprehensive health care.

Acknowledgments

We would like to acknowledge the research assistance of Tufts University School of Medicine MD/MPH candidate Joanna Chen.

Notes

1. Patient-Centered Medical Home Standards developed by the National Committee for Quality Assurance (NCQA) in 2008 and updated in 2014:
    1) Patient-Centered Access;
    2) Team-Based Care;
    3) Population Health Management;
    4) Care Management and Support;
    5) Care Coordination and Care Transitions;
    6) Performance Measurement and Quality Improvement.

References

Advisory Committee on Immunization Practices (ACIP). 1991. "Hepatitis B Virus: A Comprehensive Strategy for Eliminating Transmission in the United States through Universal Childhood Vaccination: Recommendations of the Immunization Practices Advisory Committee (ACIP)." *Morbidity and Mortality Weekly Report; Centers for Disease Control* 40(RR-13): 1–25.

Asian Liver Center. "2013 Physician's Guide to Hepatitis B: A Silent Killer." Stanford University School of Medicine, Policy Paper, 2013.

Barbosa, C., Smith, E. A., Hoerger, T. J., Fenlon, N., Schillie, S. F., Bradley, C., and T. V. Murphy. 2014. "Cost-Effectiveness Analysis of the

National Perinatal Hepatitis B Prevention Program." *Pediatrics* 133(2): 243–53.

Beasley, R. P., Trepo, C., Stevens, C. E., and W. Szmuness. 1977. "The E Antigen and Vertical Transmission of Hepatitis B Surface Antigen." *American Journal of Epidemiology* 105(2): 94–8.

Centers for Disease Control (CDC). 1988. "Prevention of Perinatal Transmission of Hepatitis B Virus: Prenatal Screening of All Pregnant Women for Hepatitis B Surface Antigen." *Morbidity and Mortality Weekly Report* 37(22): 341–6, 351.

—. 2012. "Hepatitis B Information for Health Professionals." Centers for Disease Control and Prevention. http://www.cdc.gov/hepatitis/HBV/ (accessed March 28, 2014).

—. 2009. "Hepatitis B Vaccine Birth Dose Rates, National Immunization Survey." Viral Hepatitis State and Local Partners: Centers for Disease Control and Prevention. http://www.cdc.gov/Hepatitis/Partners/PeriHepBCoord.htm (accessed March 14, 2014).

—. 2013. "Know Hepatitis B Questions and Answers." Know Hepatitis B: Centers for Disease Control and Prevention. http://www.cdc.gov/knowhepatitisb/FAQs.htm (accessed March 13, 2014).

Chao, S., Lee, P. V., Prapong, W., Su, J., and S. So. 2004. "High Prevalence of Chronic Hepatitis B (Hbv) Infection in Adult Chinese Americans Living in California." *Hepatology* 40(S4): 717A.

Cohen, C., Evans, A. A., London, W. T., Block, J., Conti, M., and T. Block. 2008. "Underestimation of Chronic Hepatitis B Virus Infection in the United States of America." *Journal of Viral Hepatitis* 15(1): 12–13.

Cohen, C., Chen, G., Block, J., Sui, P., Duan, L., Evans, A. A., and W. T. London. 2009. "Chronic Hepatitis B in Chinese Immigrants: Reducing Barriers to Health Care Access." Paper presented at the American Public Health Association Annual Meeting, Philadelphia, PA, November 7–11.

Davis, K., Abrams, M., and K. Stremikis. 2011. "How the Affordable Care Act Will Strengthen the Nation's Primary Care Foundation." *Journal of General Internal Medicine* 26(10): 1201–3.

Gish, R. G. and A. C. Gadano. 2006. "Chronic Hepatitis B: Current Epidemiology in the Americas and Implications for Management." *Journal of Viral Hepatitis* 13(12): 787–98.

Glasgow, R. E., Wagner, E. H., Schaefer, J. Mahoney, L. D., Reid, R. J., and S. M. Greene. 2005. "Development and Validation of the Patient Assessment of Chronic Illness Care." *Medical Care* 43(5): 436–44.

Health Resources and Services Administration, Bureau of Primary Health Care. 2013. "The Affordable Care Act and Health Centers." http://bphc.hrsa.gov/about/healthcenterfactsheet.pdf (accessed August 22, 2014).

Hu, K. Q. 2008. "Hepatitis B Virus (HBV) Infection in Asian and Pacific Islander Americans (APIAs): How Can We Do Better for This Special Population?" *American Journal of Gastroenterology* 103(7): 1824–33.

Institute of Medicine (IOM). "Hepatitis and Liver Cancer: A National Strategy for the Prevention and Control of Hepatitis B and C." Washington, D.C., 2010.

Kowdley, K. V., Wang, C. C., Welch, S., Roberts, H., and C. L. Brosgart. 2012. "Prevalence of Chronic Hepatitis B among Foreign-Born Persons Living in the United States by Country of Origin." *Hepatology* 56(2): 422–33.

Kumar, R., Korthuis, P. T., Saha, S., Chander, G., Sharp, V., Cohn, J., Moore, R., and M. C. Beach. 2010. "Decision-Making Role Preferences among Patients with HIV: Associations with Patient and Provider Characteristics and Communication Behaviors." *Journal of General Internal Medicine* 25(6): 517–23.

Landon, B. E., Gill, J. M., Antonelli, R. C., and E. C. Rich. 2010a. "Prospects for Rebuilding Primary Care Using the Patient-Centered Medical Home." *Health Affairs* 29(5): 827–34.

—. 2010b. "Using Evidence to Inform Policy: Developing a Policy-Relevant Research Agenda for the Patient-Centered Medical Home." *Journal of General Internal Medicine* 25(6): 581–3.

Lok, A. S., and B. J. McMahon. 2001. "Chronic Hepatitis B." *Hepatology* 34(6): 1225–41.

Ma, G. X., Fang, C. Y., Shive, S. E., Toubbeh, J., Tan, Y., and P. Siu. 2007. "Risk Perceptions and Barriers to Hepatitis B Screening and Vaccination among Vietnamese Immigrants." *Journal of Immigrant and Minority Health / Center for Minority Public Health* 9(3): 213–20.

Ma, G. X., Shive, S. E., Toubbeh, J. I., Tan, Y., and D. Wu. 2008. "Knowledge, Attitudes, and Behaviors of Chinese Hepatitis B Screening and Vaccination." *American Journal of Health Behavior* 32(2): 178–87.

Margolis, H. S., Coleman, P. J., Brown, R. E., Mast, E. E., Sheingold, S. H., and J. A. Arevalo. 1995. "Prevention of Hepatitis B Virus Transmission by Immunization: An Economic Analysis of Current Recommendations." *Journal of the American Medical Association* 274(15): 1201–8.

Mast, E. E., Margolis, H. S., Fiore, A. E., Brink, E. W., Goldstein, S. T., Wang, S. A., Moyer, L. A., Bell, B. P., and M. J. Alter. 2005. "A Comprehensive Immunization Strategy to Eliminate Transmission of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices (ACIP). Part 1: Immunization of Infants, Children, and Adolescents." *Morbidity and Mortality Weekly Report; Centers for Disease Control* 54(RR-16): 1–31.

Moses, K., and B. Ensslin. "Seizing the Opportunity: Early Medicaid Health Home Lessons." Edited by Center for Health Care Strategies, Inc., Policy Paper, 2014.

National Cancer Institute (NCI). "SEER Cancer Statistics Review, 1975–2002." Bethesda, MD, 2004.

National Committee for Quality Assurance (NCQA). "Standards and Guidelines for Physician Practice Connections–Patient-Centered Medical Home (PPC–PCMH)." Washington, D.C., 2008.

—. "PCMH 2011–PCMH 2014 Crosswalk: Meaningful Use Alignment." 2014. http://www.ncqa.org/Programs/Recognition/Practices/PatientCenteredMedicalHomePCMH/PCMH2011PCMH2014Crosswalk.aspx (accessed August 22, 2014).

National Partnership for Women and Families. 2014a. "Patient-Centered Medical Home Advocate Toolkit." http://www.nationalpartnership.org/issues/health/patient-centered-medical-home-tools.html (accessed March 14, 2014).

—. "Principles for Patient- and Family-Centered Care: The Medical Home from the Consumer Perspective." Policy Paper, Washington, D.C., 2014b. http://www.nationalpartnership.org/research-library/health-care/HIT/principles-for-patient.pdf (accessed March 14, 2014).

National Quality Forum (NQF). "#0475 Hepatitis B Vaccine Coverage among All Live Newborn Infants Prior to Hospital or Birthing Facility Discharge." Washington, D.C., 2012.

Patient-Centered Primary Care Collaborative (PCPCC). 2014. "Defining the Medical Home." Patient-Centered Primary Care Collaborative. http://www.pcpcc.org/about/medical-home (accessed March 15, 2014).

Pollack, H., Wan, K., Miyoshi, T., Tawdekar, S., Baker, P., McEwen, D., Weinbaum, C., Bialek, S. R., Fryer, G., and R. Low. 2007. "Management of Chronic Hepatitis B Virus (Hbv) Infection by Primary Care Physicians in Urban Hospitals and Clinics in New York City." *Hepatology* 46(1): 676A.

Robert Wood Johnson Foundation (RWJF). 2014. "Improving Chronic Illness: The Chronic Care Model." Improving Chronic Illness Care. http://www.improvingchroniccare.org/index.php?p=The_Chronic_Care_Model&s=2 (accessed March 13, 2014).

Shepard, C. W., Simard, E. P., Finelli, L., Fiore, A. E., and B. P. Bell. 2006. "Hepatitis B Virus Infection: Epidemiology and Vaccination." *Epidemiologic Reviews* 28: 112–25.

Smith, E. A., Jacques-Carroll, L., Walker, T. Y., Sirotkin, B., and T. V. Murphy. 2012. "The National Perinatal Hepatitis B Prevention Program, 1994–2008." *Pediatrics* 129(4): 609–16.

Taylor, V. M., Tu, S. P., Woodall, E., Acorda, E., Chen, H., Choe, J., Li, L., Yasui, Y., and T. G. Hislop. 2006. "Hepatitis B Knowledge and Practices among Chinese Immigrants to the United States." *Asian Pacific Journal of Cancer Prevention* 7(2): 313–7.

Thompson, M. J., Taylor, V. M., Jackson, J. C., Yasui, Y., Kuniyuki, A., Tu, S. P., and T. G. Hislop. 2002. "Hepatitis B Knowledge and Practices among Chinese American Women in Seattle, Washington." *Journal of Cancer Education: The Official Journal of the American Association for Cancer Education* 17(4): 222–6.

Tong, M. J., Pan, C. Q., Hann, H. W., Kowdley, K. V., Han, S. H., Min, A. D., and T. S. Leduc. 2011. "The Management of Chronic Hepatitis B in Asian Americans." *Digestive Diseases and Sciences* 56(11): 3143–62.

Wagner, E. H. 1998. "Chronic Disease Management: What Will It Take to Improve Care for Chronic Illness?" *Effective Clinical Practice* 1(1): 2–4.

Ward, J. W. 2008. "Time for Renewed Commitment to Viral Hepatitis Prevention." *American Journal of Public Health* 98(5): 779–81.

Wong, W., Dankwa-Mullan, I., Simon, M. A., and W. A. Vega. "The Patient-Centered Medical Home: A Path toward Health Equity?" Discussion Paper, Institute of Medicine, Washington, DC. 2012.

Isha Weerasinghe is the senior policy analyst for the Association of Asian Pacific Community Health Organizations (AAPCHO). Prior to joining AAPCHO, she worked at New York University's B Free CEED, a CDC-funded project that used community-based participatory research to increase hepatitis B screening levels and decrease stigma in Asian communities in NYC. Isha is vice-chair of the National Taskforce on Hepatitis B: Focus on AAPIs, and she is a board member of the South Asian Public Health Association. She holds a Master in Science from the Department of Social Policy in the London School of Economics and Political Science.

Nicole Bannister, MPH, MS, is the hepatitis B program associate at the CBWCHC in New York City. Ms. Bannister received her Master in Science in Physiology from Colorado University–Boulder and her Master in Public Health in Health Promotion from Columbia University. Currently, she also serves as the coorganizer of the NYC Hepatitis B Coalition.

Vivian Huang, MD, MPH, is the hepatitis B program director at CBWCHC in New York City. Dr. Huang is board-certified in internal medicine and preventive medicine. She received her Master in Public Health from Columbia University and completed her preventive medicine training with the NYC Department of Health and Mental Hygiene. Her interests include global health and health disparities, particularly in the Asian American community.

Chari Cohen is director of public health for the Hepatitis B Foundation (HBF). Her research focuses on reducing hepatitis B-related health disparities through community programming. Ms. Cohen directs Hep B United, Philadelphia, and helps lead Hep B United, a national coalition that addresses hepatitis B. Ms. Cohen is chair of CHIPO: Coalition against Hepatitis for People of African Origin. She sits on the steering committee for the National Viral Hepatitis Roundtable and the Asian Pacific Islander Caucus of the American Public Health Association. Ms. Cohen received her Master in Public Health from Temple University and is a Doctor of Public Health candidate at Drexel University.

Jeffrey B. Caballero, MPH, is executive director of the Association of Asian Pacific Community Health Organizations (AAPCHO) and has been with AAPCHO since 1993. Mr. Caballero advocates for programs and policies that increase access to high-quality, comprehensive community health care services that are culturally and linguistically appropriate. Mr. Caballero participates on national committees addressing disparity issues affecting Asian Americans, Native Hawaiians, and Pacific Islanders, such as tuberculosis, hepatitis B, diabetes, and cancer. Mr. Caballero has also served as vice-chair of the National Viral Hepatitis Roundtable, National Board Member of the American Diabetes Association, and the National Diabetes Education Program's Executive Committee.

Su Wang, MD, MPH, is the medical director of the Center for Asian Health at Saint Barnabas Medical Center in Livingston, NJ. A practicing internist, she previously served as assistant director of medical affairs at the CBWCHC. Dr. Wang directed the Hepatitis B programs at CBWCHC and led community outreach, clinical care initiatives, and community-based research. Dr. Wang was a reviewer for the Institutes of Medicine report "Hepatitis and Liver Cancer: A National Strategy for Prevention and Control of Hepatitis B and C." Dr. Wang received her medical degree from the University of Miami and a Master of Science in Public Health from Johns Hopkins School of Public Health.