

# Letters

## RESEARCH LETTER

### Screening for Hepatitis B Infection in Pregnant Women: Updated Evidence Report and Systematic Review for the US Preventive Services Task Force

Hepatitis B virus (HBV) is transmitted through contact with blood or bodily fluids of an infected individual, including perinatal transmission from an infected mother to her child, with most of the latter cases occurring during delivery. Chronic infections develop in 80% to 90% of infants infected with HBV, often resulting in serious long-term health complications such as cirrhosis, liver failure, hepatocellular carcinoma, and death.<sup>1</sup>



Editorial page 312



Author Audio Interview



Related article page 349 and  
JAMA Patient Page page 376

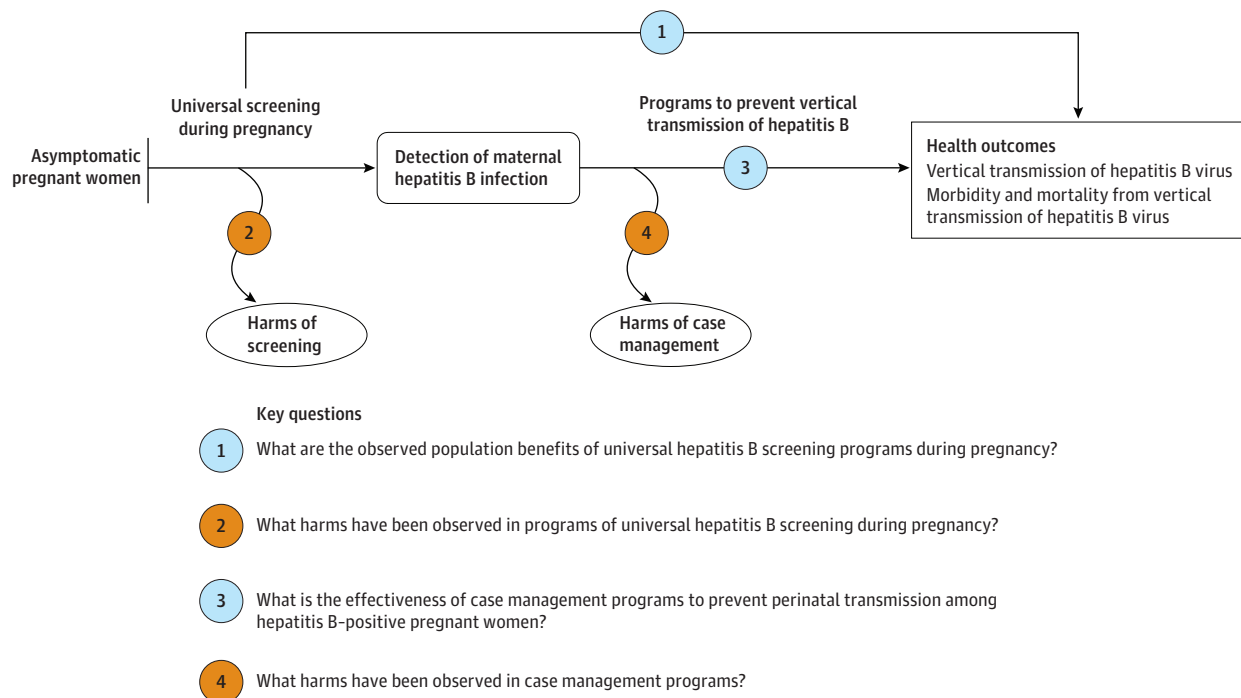
Hepatitis B virus screening in pregnancy, which has been a standard of care for more than 30 years, aims to identify women at risk of transmitting the infection to their infants to ensure the timely delivery of effective prophylactic

interventions, ideally through case management programs using evidence-based care protocols.<sup>1</sup> Neonatal vaccination and hepatitis B immune globulin are effective for preventing perinatal transmission.<sup>1</sup>

Since 1996, the US Preventive Services Task Force (USPSTF) has maintained an A recommendation to screen for HBV in pregnancy. This brief evidence update was conducted to inform the USPSTF in updating its 2009 recommendation.<sup>2</sup>

**Methods** | A literature search of MEDLINE, PubMed Publisher-Supplied Records, the Cochrane Database of Systematic Reviews, the Cochrane Central Register of Controlled Trials, the Cumulative Index for Nursing and Allied Health Literature, EMBASE, and PsycInfo was conducted from January 1, 1986, to May 3, 2018. Ongoing surveillance in targeted publications was conducted through January 25, 2019. The search dates and inclusion/exclusion criteria were designed to yield evidence on the overarching effectiveness of programs for HBV screening and case management, since the effectiveness of clinical interventions for prevention of HBV transmission is well established and the foundation for prior

Figure. Analytic Framework: Screening for Hepatitis B Infection in Pregnant Women



Evidence reviews for the US Preventive Services Task Force (USPSTF) use an analytic framework to visually display the key questions that the review will address to allow the USPSTF to evaluate the effectiveness and safety of a

preventive service. The questions are depicted by linkages that relate to interventions and outcomes. Further details are available from the USPSTF Procedure Manual.

Table. Comparison of Foundational and New Evidence: Screening for HBV Infection in Pregnant Women

Rationale and Foundational Evidence for Previous USPSTF Recommendations on HBV Screening in Pregnancy	New Evidence Findings	Limitations of New Evidence	Consistency of New Evidence With Foundational Evidence and Current Understanding
<b>Benefits</b>			
Screening: Screening is highly accurate and identifies infants at risk of perinatal transmission; universal screening is important because known risk factors are present in only 35% to 65% of HBV-positive pregnant women Treatment: Effective preventive measures (vaccination within 12 h of birth, HBIG administration) exist for preventing perinatal transmission and sequelae	Screening: No new evidence Treatment (case management): 2 observational studies of effectiveness of case management programs for infants at risk of perinatal HBV transmission in United States: 1 study of the national public health system program and 1 study in an integrated health system Case management in the integrated health system attained very high rates of on-time prophylaxis completion Very low perinatal transmission rates (0.5%-0.8%) reported in most recent years that had been trending downward over time	Observational studies that cannot control for the effects of trends over time in historical, population, or record-keeping factors that could also influence estimates Program data are not complete and are based on unverified reports by physicians, hospitals, and laboratories; loss to follow-up, missing data, and differences in data collection procedures may have had a greater effect on estimates from earlier years of data	The included observational studies suggest improving trends for prevention of perinatal transmission among infants who have completed case-management programs A high proportion of infants in case-management programs are documented as having HBIG and HBV vaccination at birth and 3 vaccine doses by 12 mo Screening for hepatitis B infection in pregnancy can identify infants at risk of perinatal transmission to identify them for case management
<b>Harms</b>			
Screening: Highly accurate test, low false-positive rate, no serious harms reported Treatment: None identified, and universal vaccination of all infants recommended regardless of maternal HBV status; HBIG harms not reported	Screening: No new studies of screening were identified Treatment: No harms of screening or case management reported in the included study	Program data do not capture potential harms of screening, other than reasons for loss to case-management program follow-up	No harms of screening or case management reported in foundational or included evidence

Abbreviations: HBIG, hepatitis B immune globulin; HBV, hepatitis B virus.

recommendations. Two investigators independently evaluated articles that met inclusion criteria and summarized the data. An analytic framework and 4 key questions (KQs) guided the evidence update (Figure). Detailed methods, including the search strategy, inclusion and exclusion criteria, critical appraisal criteria, and a list of excluded studies, are available in the full evidence report at <http://www.uspreventiveservicestaskforce.org/Page/Document/UpdateSummaryFinal/hepatitis-b-virus-infection-in-pregnant-women-screening>.

**Results** | We screened 5688 titles and abstracts and 499 full-text articles. No studies were identified for KQ1 or KQ2 that addressed the effects of screening programs on perinatal HBV transmission or potential harms of screening. Two fair-quality observational studies that compared perinatal transmission rates over time were included for KQ3 (Table).<sup>3,4</sup> One study reported outcomes of 155 081 infants born to HBV-positive women identified for case management through the national Perinatal Hepatitis B Prevention Program, administered by the Centers for Disease Control and Prevention, from 1994 to 2008.<sup>3</sup> The second study reported outcomes of case management for 4446 infants born to HBV-positive women in a large, regional health care organization in the United States between 1997 and 2010.<sup>4</sup> Both studies documented low rates of perinatal transmission for the reported periods (0.5%-1.9%), with reductions over time. No studies were identified for KQ4 to assess potential harms of case management.

**Discussion** | Before the widespread availability of postexposure prophylaxis, the proportion of infants born to hepatitis B surface antigen-positive women acquiring HBV infection was approximately 30% for those born to hepatitis B envelope antigen (HBeAg)-negative mothers and 85% for those born to HBeAg-positive mothers.<sup>1</sup> A foundational body of evidence from an earlier era has demonstrated the effectiveness of screening pregnant women and postexposure prophylactic interventions for reducing the risk of perinatal transmission.<sup>1</sup> Two observational studies of modern case management programs further support the value of prenatal screening to identify infants for prophylactic interventions. The decreasing trend in perinatal transmission observed in the studies may be due to various factors, such as improvements in evidence-based protocols delivered in case management or improvements in implementation, including case identification and tracking.

Targeted resources are needed to ensure that case management is effectively implemented through health care that reaches vulnerable populations most at risk of perinatal transmission of HBV, including women born in countries where HBV is endemic. Improving access to prenatal care, screening, and case management are among the strategies to help to eliminate perinatal HBV infection in the United States.<sup>5</sup>

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**Author Contributions:** Dr Henderson had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

*Concept and design:* All authors.

*Acquisition, analysis, or interpretation of data:* All authors.

*Drafting of the manuscript:* All authors.

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**Editorial Disclaimer:** This evidence report is presented as a document in support of the accompanying USPSTF Recommendation Statement. It did not undergo additional peer review after submission to *JAMA*.

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