

SUPPLEMENTARY TEXT 1. Provider Guidance on Risk Assessment and Clinical Decision-Making for Hepatitis A Postexposure Prophylaxis

Healthy persons who have completed the 2-dose hepatitis A (HepA) vaccination series at any time do not need additional post-exposure prophylaxis (PEP) if they are exposed to hepatitis A virus. HepA vaccine provides protective antibody levels 20 years after childhood vaccination with the 2-dose series (1), and detectable antibodies are estimated to persist for 40 years or longer based on mathematical modeling and anti-hepatitis A virus (HAV) kinetic studies (2,3) and might be lifelong. Protective anti-HAV levels after a single dose of inactivated HepA vaccine have been demonstrated to persist for at least 11 years (4). The effectiveness of PEP is greater the sooner after exposure it is administered. Therefore, if only immune globulin (IG) (5) or only vaccine is available, either available product should be administered as soon as possible; the exposed person may return for the other product if it becomes available within 14 days of exposure. If administered simultaneously, HepA vaccine and IG should be administered in separate anatomical sites (e.g., different limbs) (6). The HepA vaccine series should be completed with a second dose at least 6 months after the first dose for long-term protection.

No data are available on the efficacy of combination hepatitis A and hepatitis B vaccine (Twinrix) for prophylaxis after exposure to HAV in outbreak settings, as it is licensed only for adults and contains half the hepatitis A antigen contained in adult HepA vaccines. Therefore, Twinrix should not be used for postexposure prophylaxis, but may be used to confer protection to at-risk but not yet exposed persons during an outbreak.

Patient characteristics associated with more severe manifestations of hepatitis A infection, the ability of the patient to develop protective level of antibodies after receipt of HepA vaccine, the magnitude of the risk for HAV transmission from the exposure (see section below), and availability of IG and

vaccine should be considered in decisions to use IG and/or vaccine (7). Immunocompromised persons and persons less capable of developing a normal immune response might not respond fully to vaccination (6). HepA vaccine should be given as PEP, with or without IG, in populations recommended to receive HepA vaccine because it provides long-term immunity that IG does not provide (1–3). Adults who are routinely recommended to receive HepA vaccine are travelers to hepatitis A endemic areas, men who have sex with men, persons who use injection and non-injection drugs, persons with chronic liver disease, persons with clotting factor disorders, persons working with nonhuman primates, and household members and other close personal contacts of adopted children newly arriving from countries with high or intermediate hepatitis A endemicity (8). In addition, homelessness has been associated with hepatitis A cases and outbreaks (9), and homelessness was approved as an indication for hepatitis A vaccination by the Advisory Committee on Immunization Practices (ACIP) at the October 2018 meeting. In general, the risk of infection after a household or sexual exposure is likely to be greater than the risk associated with a common source exposure (e.g., exposure to a contaminated food product or restaurant exposure) (10).

Risk for HAV Transmission in Various Settings and for Various Groups

The risk for transmission of HAV is influenced by host and environmental factors and varies considerably in different settings. For example, without PEP, secondary attack rates of 15%–30% have been reported in households, with higher rates of transmission occurring from infected young children than from infected adolescents and adults (11–13). In contrast, attack rates among patrons of food service establishments who have been exposed to HAV-infected food handlers are generally low (10,14–16). Given both the difficulty in determining precise timing and extent of exposure and potential repeated exposures, as well as concerns over the administration and availability of IG (5,16), provider guidance based on risk is provided below.

Close personal contact. PEP should be administered to all previously unvaccinated persons who have been exposed or are at risk of exposure due to close personal contact with a person who has serologically confirmed hepatitis A infection (e.g., household and sexual contacts; persons using injection or non-injection drugs with the case; caretakers not using appropriate personal protective equipment).

Child care centers. PEP should be administered to all previously unvaccinated staff members and attendees of child care centers or institutions if: 1) one or more cases of hepatitis A infection are recognized in children or 2) cases are recognized in two or more households of center attendees. If one or more cases of hepatitis A infection occurs among employees, PEP should be considered based on the duties, hygienic practices and presence of symptoms at work. In centers that do not provide care to children who wear diapers, PEP may be administered only to care center contacts of the index patient. When an outbreak occurs (i.e., hepatitis A cases in two or more families), PEP also should be considered for members of households that have children (center attendees) in diapers.

Common-source food exposure and food handlers. Food handlers are not at increased risk for hepatitis A because of their occupation (10). Most food handlers with HAV infection do not transmit HAV to exposed consumers or restaurant patrons (10,14,16). Because common-source transmission to patrons is unlikely, administering PEP to patrons typically is not indicated. If, during the time when the food handler was likely to be infectious, the food handler both directly handled uncooked or cooked foods without gloves and had diarrhea or poor hygienic practices, the risk for individual patrons remains low, but PEP may be considered (16). PEP in this scenario should generally consist of vaccination for persons aged ≥ 12 months, though IG may be considered in addition to vaccine for exposed persons (patrons during the time the food handler was symptomatic and worked) who are immunocompromised or have chronic liver disease. In settings in which

repeated exposures to HAV might have occurred (e.g., institutional cafeterias), consideration of HepA vaccine and/or IG use is warranted.

Settings providing services to children and adults. PEP is not routinely indicated when a single case occurs in an elementary or secondary school or an office or other work setting, and the source of infection is outside of the setting. Similarly, when a person who has HAV infection is admitted to a hospital, staff members should not routinely be administered PEP; instead, appropriate infection control practices should be emphasized, i.e., standard and contact precautions for diapered or incontinent patients (17). PEP should be administered to persons who have close contact with index patients if an epidemiologic investigation indicates HAV transmission has occurred among students in a school or among patients or between patients and staff members in a hospital. PEP should be considered for all previously unvaccinated residents and employees when a confirmed hepatitis A case occurs in a setting where close personal contact occurs regularly and hygiene standards are difficult to maintain (e.g., correctional facility, homeless shelter, psychiatric facility, group home or residential facility for the disabled). In a setting containing multiple enclosed units or sections (e.g., prison ward), PEP administration should be limited only to persons in the area where there is exposure risk.

Immunocompromised Persons

Although most persons who have completed the recommended 2-dose HepA vaccine series at any time do not need additional vaccine, vaccination or revaccination doses of HepA vaccine are recommended after hematopoietic cell transplant (6); therefore, recipients who have not been revaccinated after transplant should receive HepA vaccine and IG. Other severely immunocompromised persons who have been vaccinated in the past may also benefit from PEP and

should be assessed on an individual basis. Persons who receive routine IG administration for an immunocompromising condition should also be assessed on an individual basis.

Pregnancy

Infants born to mothers with HAV infection during pregnancy are usually healthy, but hepatitis A infection during pregnancy has been associated with gestational complications (e.g. preterm labor, placental abruption, premature rupture of membranes) (18,19). Pregnant women who have a specific risk (e.g., HAV exposure) are recommended to receive the HepA vaccine (20). IG can be administered (8) in addition to HepA vaccine with consideration of the likelihood of HAV exposure during pregnancy. There has been no observed increase in maternal or infant adverse events after HepA vaccination or IG administration in pregnancy (8,21).

Health Care Institutions

Healthcare personnel do not have increased prevalence of HAV infection and health care-associated outbreaks of HAV are rare. Therefore, HepA vaccination is not routinely recommended for health care personnel in the United States. Outbreaks have been observed in neonatal intensive care units because of infants acquiring infection from transfused blood and subsequently transmitting HAV to other infants and staff (22,23). Outbreaks of hepatitis A caused by transmission from patients to health care personnel are typically associated with fecal incontinence and inadequate hand hygiene (24), although the majority of hospitalized patients who have hepatitis A infection are admitted after onset of jaundice, when they are beyond the point of peak infectivity (25,26). In hospitals, sharing food or beverages between patients, families and healthcare personnel has been associated with HAV transmission (27,28).

If a healthcare provider receives a diagnosis of hepatitis A infection, PEP should be administered to other healthcare personnel at the same facility. In a setting containing multiple enclosed units or

sections (e.g., hospital, psychiatric facility), PEP administration can be limited only to health care personnel in the area where there is exposure risk (e.g., cardiology ward, intensive care unit). PEP administration to patients can be considered if during the time of patient care the infected healthcare provider was likely to be infectious, did not use gloves when appropriate and had diarrhea or poor hygienic practices.

Workers Exposed to Sewage

Studies on the incidence of clinical hepatitis A infection do not show an increased risk in workers exposed to sewage. No work-related instances of HAV transmission have been reported among wastewater workers in the United States. Persons who work with sewage (e.g., plumbers) are not a risk group for HAV infection (29).

Natural Disaster Settings with Flooding

Waterborne HAV outbreaks are infrequent in developed countries with properly maintained sanitation and water supplies (30). In the United States, floods are unlikely to cause outbreaks of communicable diseases, and outbreaks of HAV caused by flooding have not been documented.

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