

Hepatitis A

Zack Moore, MD, MPH

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I'm Zack Moore, medical epidemiologist with the North Carolina Division of Public Health. Today I will be speaking to you about hepatitis A.

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At the end of this presentation, you should recognize the impact of vaccination on hepatitis A epidemiology in the US; be able to identify common risk factors for hepatitis A; and be able to determine who needs prophylaxis after exposure to a person with hepatitis A.

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Hepatitis A virus, or "HAV", is a common cause of acute liver disease. It is estimated that 32,000 new infections occurred in the US in 2006. Overall, 1/3 of the US population has evidence of immunity from past infection, including $\frac{3}{4}$ of persons over 70 years of age.

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Hepatitis A vaccine has been one of the great recent success stories in public health. Hepatitis A vaccines were first licensed in 1995, and the number of people for whom vaccine is recommended has gradually expanded since then. Vaccine was first recommended for high risk groups in 1996. It was recommended for all children in high incidence areas in 1999, and then for all children 12-23 months of age nationwide beginning in 2006. Recently, vaccine has also been recommended for post-exposure prophylaxis in people 1-40 years of age, and for household members and close contacts of international adoptees.

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This slide shows the dramatic decrease in hepatitis A infections that has occurred since vaccines became available in the United States. The incidence has decreased from an average of 11 reported cases per 100,000 people before vaccination, to 1 reported case per 100,000 people in 2007. This decrease has been greatest among children. Until 1998, children 5-14 years of age had the highest rates of infection, but now the incidence is highest among young adults.

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Despite these successes, hepatitis A is still a major public health problem. It is one of the most frequently reported diseases nationally, and has a major economic impact because of the cost required to identify contacts and provide prophylaxis.

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Hepatitis A has an average incubation period of 28 days, but this can range from 15-50 days. This lag between exposure and disease makes it hard to identify the source of

infection. People with hepatitis A are also infectious for a long period of time. The infectious period is from 2 weeks before jaundice onset to 1 week after that. If the patient did not have jaundice, or the jaundice onset date is unknown, the infectious period is considered to be from 1 week before to 2 weeks after the onset of other symptoms. These are general ranges. Shedding can be longer in some cases, particularly in young children.

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HAV is transmitted by the fecal-oral route. In the United States, person-to-person transmission is most common. Common-source outbreaks do occur, but a specific source is rarely identified. The most commonly reported risk factor for hepatitis A infection is travel to a highly endemic country, particularly Mexico or Central and South America. Contact to a known case, male homosexual activity, and IV drug use are also frequently reported, but no risk factor is identified for the majority of cases.

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Hepatitis A infection is often asymptomatic in children. Children are an important reservoir for infection, since they often don't have symptoms and can shed virus for months. More than 75% of infected adults do develop jaundice. Illness can be severe; more than 30% of patients require hospitalization, although <1% of cases result in death.

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This slide shows the typical timing of events in hepatitis A infection. As noted earlier, clinical illness begins 15-50 days after exposure, as shown by the green bar.

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Liver enzymes start to increase before symptoms appear and usually peak during clinical illness (as shown by the yellow line).

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IgM antibodies against hepatitis A are used to confirm hepatitis A infection. These antibodies are generally present 5-10 days before the onset of symptoms (as shown by the blue dashed line) and are usually detectable for only 6 months or less.

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IgG antibodies against hepatitis A also appear early in the course of infection (as shown by the white dashed line). These remain detectable for the lifetime of the individual and confer lifelong protection. For this reason, IgG and total antibody levels are not helpful in diagnosing acute hepatitis A infection.

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HAV replicates in the liver and is shed in the stool. The period of viral shedding peaks during the 2-week period before onset of jaundice and declines after jaundice appears, as shown by the red bar. Children and infants can shed HAV for longer periods than adults, sometime for several months.

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The case definition for hepatitis A requires an acute illness with discrete onset of symptoms and either jaundice/dark urine or elevated aminotransferase levels. To be confirmed, cases must also have IgM antibody to hepatitis A virus or be directly linked to a lab-confirmed case.

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If you are a communicable disease nurse, hepatitis A is a disease that requires your immediate attention. This means following up on positive labs on the same day they are received, even if you are in clinic or handling other responsibilities. When a possible case of hepatitis A is identified, it is important to remember the following parts of the case investigation: first, determine whether the person had clinical features consistent with hepatitis A. Second, review the serology results to confirm a positive IgM; results can be confirmed at the state lab if needed. Remember that IgG and total antibody levels are not useful in diagnosing hepatitis A. Third, identify risk factors for hepatitis A, including international travel as well as a food history. Finally, it is important to identify all contacts who might need post-exposure prophylaxis.

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Post-exposure prophylaxis should be considered for susceptible individuals who are household or sexual contacts to a case, to child care center staff and attendees if one or more cases are identified in the facility, or if 2 or more cases are identified in households of childcare attendees. If a case is identified in a food handler who worked while infectious, prophylaxis should be considered for other food handlers and possibly for patrons, depending on the circumstances. Hepatitis A vaccine is recommended for post-exposure prophylaxis of contacts who are 1-40 years of age, and immune globulin is recommended for contacts outside this age range. Prophylaxis is not generally considered effective if it is given more than two weeks after the exposure.

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If you need to administer prophylaxis to contacts of a hepatitis A case, first contact your CD nurse consultant or the communicable disease branch epidemiologist on call. We will coordinate with the Immunization Branch to make sure you receive enough vaccine or immune globulin for all contacts. Since prophylaxis is not always effective, you should advise all contacts to call you if they develop symptoms of hepatitis.

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When deciding who might need post-exposure prophylaxis, it is often helpful to draw out the infectious period and exposure period on a calendar. In this example, jaundice onset occurred on the 19th. The infectious period for this case would begin two weeks before this date, and end one week after. Prophylaxis is only effective if given within two weeks of the exposure. Therefore, if the public health notification did not occur until the 31st, prophylaxis would not only be indicated for contacts who were exposed during the infectious period, but also within the past two weeks.

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If the case did not have jaundice or jaundice onset was unknown, the infectious period should be based on symptom onset. In this example, onset occurred on the 15th. The infectious period for this case would begin one week before this date, and end two weeks after. In this example, notification of the case occurred on the 31st. As in the last example, prophylaxis is indicated for susceptible contacts who were exposed during the infectious period and also within the past two weeks.

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To summarize, hepatitis A has decreased dramatically due to routine use of hepatitis A vaccine. However, it is still a major public health problem. International travel is the most commonly identified risk factor, but no risk factor is identified in the majority of confirmed cases. Finally, decisions about post-exposure prophylaxis should be based on type of exposure, the infectious period, and time since last exposure. It is often helpful to use a calendar to figure out when these periods overlap.

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References for this slide presentation are listed here.