HCV in Children and Adolescents

This is a PDF version of the following document:
Module 6: Treatment of Key Populations and Unique Situations
Lesson 7: HCV in Children and Adolescents

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Epidemiology of HCV In Children and Adolescents

The route of hepatitis C virus (HCV) acquisition among children and adolescents varies substantially by age, with perinatal transmission being the predominant risk factor among infants and young children, and injection drug use being the leading risk factor among adolescents and young adults.[1]

New Hepatitis C Infections in Children and Adolescents

The Centers for Disease Control and Prevention (CDC) provides data on an annual basis on newly diagnosed acute and chronic infections for individuals in the United States, including specific data for persons 0–19 years of age (Figure 1).[2,3] Among cases reported for persons 0–19 years of age, these data do not separate early childhood versus adolescent infections. Provisional 2024 data from the CDC reported 58 cases (0.1 per 100,000 persons) of acute HCV among children and adolescents (persons 0–19 years of age).[3] Acute infections indicate hepatitis C incidence and the reported cases likely represent a gross underestimate of the true incidence. The CDC adjusts for case underascertainment and underreporting by multiplying the reported cases by a factor of 13.9. Therefore, for 2024, the reported number of 58 cases of acute HCV in persons 0–19 years of age represents 806 estimated cases.[2,3] During 2014-2024, the number of cases of acute HCV in persons 0–19 years peaked in 2017 but has since declined.[2,3] In 2024, there were 601 cases of chronic HCV diagnosed in persons 0–19 years of age and this number has consistently declined since 2014.[2,3]

Hepatitis C Prevalence Estimates

Although data on HCV prevalence in children and adolescents living in the United States remain limited, a global modeling study using data published between 2000 and early 2019 estimated that, in 2018, approximately 46,400 individuals 18 years of age and younger were living with chronic HCV infection in the United States, yielding an estimated population prevalence of 0.06%.[4] Similarly, data from the National Health and Nutrition Examination Survey (NHANES) suggests that HCV prevalence among individuals 6–21 years of age decreased from 0.15% in 1999 – 2004 to 0.02% in 2005 – 2010, but then increased to 0.26% in 2011 – 2016.[5]

Perinatal HCV Transmission

In 2024, the CDC reported 260 cases of perinatally acquired HCV were reported to the CDC in 2024 [CDC 2023 Viral Hepatitis Surveillance Report], representing an 11% increase from 235 cases reported in 2023 and a 32% increase from 197 cases reported in 2022 (Figure 2).[2,3] Part of this increase may have resulted from more widespread testing of infants with perinatal exposure after the release of the 2020 CDC hepatitis C screening recommendations, which included the recommendation of hepatitis C screening for all pregnant

women during each pregnancy.[6] However, surveillance data are only available for 30 states and likely substantially underestimate the true incidence of perinatal HCV transmission in the United States.[2] For example, a study using commercial laboratory data estimated that, between 2011 and 2014, a total of 29,000 women with active HCV infection gave birth to an estimated 1,700 infants with perinatally acquired HCV each year.[7] For more information on factors associated with perinatal transmission of HCV and interventions to reduce the risk of mother-to-child transmission, please see the lesson in the module on Perinatal HCV Transmission.

HCV Screening Guidelines for Children and Adolescents

Screening for HCV infection in children and adolescents can potentially occur at various points between birth and age 19 years, depending on the indication. The following summarizes recommended screening in perinatally exposed infants, in young children, and in older children and adolescents.

Screening after Perinatal Exposure to HCV

All infants born to mothers with HCV should undergo testing for perinatally acquired HCV. However, when considering the timing and type of HCV testing early in life, there are several factors to understand: (1) passive transfer of anti-HCV from mother to child can persist for up to 18 months (2) transient infant viremia can occur in the first month of life, and (3) children who perinatally acquire HCV can spontaneously clear HCV infection (Figure 3).[8,9,10] In 2023, the CDC released updated guidance on HCV testing in perinatally exposed infants.[11] In these recommendations, the CDC defines perinatally exposed infants and children as those born to pregnant women with current HCV infection (positive HCV RNA during pregnancy) or probable HCV infection (reactive anti-HCV testing with no available HCV RNA results).[11] The recommendations aim to streamline HCV testing recommendations with the standard schedule for well-child visits, limiting the number of infants and children who are lost to follow-up, and to increase detection of perinatally acquired infection, allowing more children to be offered curative therapy starting as early as 3 years of age.[11]

Some experts recommend repeating HCV RNA on an annual basis prior to treatment initiation.

Infants and Children with Confirmed Perinatal Exposure to HCV

The following summarizes the 2023 CDC recommendations for HCV perinatally exposed infants and children (Figure 4):

- Perform HCV RNA testing at 2–6 months of age (this is the preferred window for testing).
- Infants and children with a positive HCV RNA test should be managed in consultation with a health care provider experienced in pediatric HCV management.
- Infants and children with an undetectable HCV RNA do not have a current HCV infection and do not require further testing.
- Infants and children 7–17 months of age who were not previously tested should undergo HCV RNA testing.
- Children 18 months of age and older who were not previously tested should undergo HCV antibody (anti-HCV) testing with reflexive RNA for those with a positive antibody test.
- Given higher rates of spontaneous HCV clearance among infants and children with perinatally acquired HCV, repeat HCV RNA should be performed (perhaps annually) prior to starting treatment, which can be initiated as early as 3 years of age.

Infants and Children with Confirmed Possible Exposure to HCV

HCV testing early in life, with HCV RNA starting at 2 months of age or anti-HCV with reflexive RNA at ≥18 months of age, should also be considered in the following situations:[11]

1. The birth mother’s HCV status is unknown because the infant and birth mother are separated, or the birth mother cannot be tested for other reasons.
2. The birth mother had risk factors for acute or chronic HCV infection (e.g., active or prior injection drug use) during pregnancy and was not tested near the time of delivery.
3. Siblings of infants or children with perinatal HCV exposure who were born to the same birth mother.

Screening in the Absence of Perinatal Exposure

There are no routine recommendations for HCV screening of persons under the age of 18 in the absence of perinatal exposure to HCV or other defined risk factors. However, the CDC does recommend one-time HCV testing for persons with recognized conditions or risk exposures to HCV, regardless of age.[6] Pertinent to children and adolescents, these recognized risk factors or exposures include:[6]

- Persons with HIV
- Persons who ever injected drugs and shared needles, syringes, or other drug preparation equipment
- Persons who ever received maintenance hemodialysis
- Persons with persistently abnormal ALT levels

It should be noted that pilot studies have demonstrated that HCV screening can be easily integrated into adolescent well visits along with other recommended screening tests.[12] In addition, any person who requests HCV testing should receive it, regardless of disclosed risk factors, as many individuals may be reluctant to disclose stigmatizing behaviors. This may be especially true for adolescents who do not wish to disclose prior or ongoing substance use. Finally, for individuals with ongoing risk factors for HCV, regardless of age, routine period testing should be performed.[6]

Natural History of HCV in Children and Adolescents

Among children with perinatally acquired HCV, approximately 20% to 40% will spontaneously clear the infection by 5 years of age.[1,11,13,14,15,16] The likelihood of spontaneous viral clearance has been associated with several host and viral factors, including the IL28B gene, natural kill cell function, HLA class, and HCV genotype.[1,13] For children who develop chronic HCV infection, the clinical course tends to be indolent, and very few children develop significant fibrosis, cirrhosis or hepatocellular carcinoma (HCC).[17,18,19,20] Although advanced liver disease, including hepatic decompensation, has been reported in children and adolescents, most studies suggest that, among children who remain untreated, complications do not occur until at least the second decade or later.[1,21] As in adults, children and adolescents with other risk factors for advanced liver disease, such as alcohol use, metabolic-associated steatotic liver disease (MASLD), HIV coinfection, or hepatitis B virus (HBV) coinfection, may experience faster progression of liver disease.[22,23,24]

Initial Assessment

In general, children and adolescents with HCV should undergo an initial assessment that includes a physical examination evaluation of disease severity via routine laboratory testing (e.g., liver function panel and complete blood count). The use of easy-to-calculate scores, including APRI, can be used to gain a general understanding of fibrosis staging. When there is concern for more advanced fibrosis or other coexisting conditions, other modalities including elastography and serum fibrosis markers can be considered, but these modalities are largely unvalidated in children.[25,26,27]

HCV Treatment Data in Children and Adolescents

Direct acting antivirals (DAAs) have been shown to be safe and effective in children as young as 3 years of age, and treatment is recommended for all children and adolescents with chronic infection. The following summarizes evidence supporting the use of DAA regimens in children and adolescents. Although many of these trials allowed for enrollment of treatment-experienced individuals and individuals with cirrhosis, it's important to note that the vast majority of children and adolescents included in these trials were non-cirrhotic and treatment naïve.

Glecaprevir-Pibrentasvir

- **DORA Study, Part 1:** This phase 2/3 nonrandomized, open-label study evaluated the pharmacokinetics, safety, and efficacy of glecaprevir-pibrentasvir in adolescents ages 12 to 17 years.[28] It included adolescents with HCV genotypes 1–4 (79% had GT1) who were treatment naïve or treatment experienced with interferon-based therapy; no participants had cirrhosis. Participants were given the adult regimen of glecaprevir-pibrentasvir for 8 (n=44) or 16 (n=3) weeks. Of the 48 individuals who were enrolled, 47 received glecaprevir-pibrentasvir, and all 47 achieved an SVR12 (100%). There were no serious adverse events, and the safety and tolerability profiles were consistent with those for adults.
- **DORA Study, Part 2**: This phase 2/3 nonrandomized, open-label study evaluated the pharmacokinetics, efficacy and safety of glecaprevir-pibrentasvir in children ages 3 to less than 12 years of age.[29] It included children with genotypes 1–6, although 73% were genotype 1, with or without compensated cirrhosis. Children were given weight-based glecaprevir-pibrentasvir for a total of 8 (n = 78), 12 (n = 1), or 16 weeks (n = 1). Overall, 80 children were enrolled, 77 (96%) of whom achieved SVR12. One participant experienced a viral relapse at post-treatment week 4, and two children discontinued glecaprevir-pibrentasvir prematurely; one due to a drug-related rash on day 4, and the other due to refusal to swallow the drug following day 1. The most common adverse events were headache (14%), vomiting (14%) and diarrhea (10%). There were no clinically significant laboratory abnormalities noted during treatment.

Sofosbuvir-Velpatasvir

- **Sofosbuvir-Velpatasvir in Children 3–17 Years of Age**: The safety and efficacy of 12 weeks of sofosbuvir-velpatasvir in children and adolescents was evaluated in a phase 2 multicenter, open-label trial that enrolled participants ages 3–17 years of age.[30] Participants could have any genotype and were treatment naïve or treatment experienced with an interferon-based regimen with or without ribavirin or a protease inhibitor. Adolescents 12–17 years of age received a fixed dose of sofosbuvir-velpatasvir 400 mg/100 mg (standard adult dose); children 6–11 years of age received a fixed dose of 200 mg/50 mg (half the adult dose); and children 3–5 years received weight-based dosing of sofosbuvir-velpatasvir. In total, 216 participants were enrolled, of whom 88% were treatment naïve and 76% had genotype 1. None had cirrhosis. A total of 199 participants (92%) achieved an SVR12, 83% (34/41) of those ages 3–5 years, 93% (68/73) of those 6–11 years, and 95% (97/102) of those 12–17 years. Among the 17 participants who did not achieve an SVR12, one participant experienced an on-treatment virologic failure, while the others either discontinued treatment early or were lost to follow-up and did not have an SVR12 assessment. The most common side effects were headache, fatigue, nausea, vomiting, and cough. One participant had a serious adverse event of auditory hallucinations that was considered to be study-drug related.

Ledipasvir-Sofosbuvir

- **Ledipasvir-Sofosbuvir**: Although available data suggests that ledipasvir-sofosbuvir is safe and effective for use in children 3 years of age and older, it is infrequently used, given its lack of pangenotypic activity (active against genotypes 1, 4, 5, and 6). In studies enrolling children and

adolescents between 3 and 17 years of age, nearly all of whom had genotype 1, 97% achieved an SVR. Across these studies, there were no serious treatment-related adverse events, and the most commonly reported side effects were headache, pyrexia, vomiting, abdominal pain, diarrhea, cough, and fatigue.[31,32,33]

Sofosbuvir-Daclatasvir

- **Sofosbuvir-Daclatasvir**: Sofosbuvir-daclatasvir is not approved for use in the United States but is commonly used globally for the treatment of HCV in both children and adults. Treatment is generally taken as a coformulated single pill but can also be given as two individual medications taken together. The World Health Organization lists sofosbuvir-daclatasvir as a preferred regimen for the treatment of chronic HCV in children and adolescents, 3 years of age and older.[34] Data supporting the safety and efficacy of sofosbuvir-daclatasvir in children and adolescents largely come from small, open-label trials in Egypt. Key studies in this age group show that more than 95% of children and adolescents achieved an SVR12 following 12 weeks of sofosbuvir-daclatasvir, with no serious adverse events.[35,36,37]

Treatment of HCV in Children and Adolescents

The following tables summarize the AASLD/IDSA and World Health Organization (WHO) HCV treatment recommendations for children and adolescents ages 3–17 years of age.[34,38] Note that none of the recommended DAA regimens are currently approved in the United States for children less than 3 years of age, and treatment in this age group is generally not recommended. Persons 18 years of age and older should be treated according to the guidelines for adults.

Initial Treatment of Children and Adolescents

The following summarizes AASLD-IDSA HCV Guidance for the treatment of HCV in children and adolescents who are treatment-naive or interferon-experienced, including children and adolescents without cirrhosis or with compensated cirrhosis(Table 1).[25,38]

Retreatment of Children and Adolescents

The following summarizes AASLD-IDSA HCV Guidance for the retreatment of HCV in children and adolescents who are DAA[-experienced, including children and adolescents without cirrhosis or with compensated cirrhosis (Table 2).[25,38]

WHO Treatment Guidelines

The following table summarizes guidelines from the WHO for the treatment of HCV, including recommendations for treatment of HCV in adolescents and children (Table 3).[34] Note that sofosbuvir-daclatasvir is no longer manufactured in the United States.

Weight-Based Dosing for Regimens in AASLD/IDSA Guidance

All DAA regimens that are FDA approved for use in children and adolescents require weight-based dosing. The following tables summarize the weight-based dosing recommendations for glecaprevir-pibrentasvir, sofosbuvir-velpatasvir, ledipasvir-sofosbuvir, and ribavirin for children aged 3 years and older (Table 4).[25]

Weight-Based Dosing for Sofosbuvir-Daclatasvir

The following summarizes WHO recommended weight-based dosing for sofosbuvir-daclatasvir, either as a fixed-dose combination or as individual tablets (Table 5).[34]

Medication Challenges

Short-Term Adverse Effects

As outlined in the section on Data on Treatment in Children and Adolescents above, there were very few serious adverse events reports across all the registration trials for DAAs in children and adolescents 3 to 17 years of age. When present, the most common side effects experienced were headache, fatigue, nausea, vomiting, abdominal pain, diarrhea, cough, and pyrexia.[28,29,30,31,32,33] In a systematic review and meta-analysis of the efficacy and safety of DAAs in children and adolescents, which included a total of 49 studies, there was a trend towards higher reported adverse events in younger children (e.g., those 3 to 5 years of age); however, serious adverse events and treatment discontinuations were rare, reported in less than 1% of children and adolescents 6 years of age and older, and in 3% of those 3–5 years of age.[39]

Long-Term Safety Concerns

Unlike interferon-based regimens, which caused linear growth arrest and long-term loss of final height, there also appear to be no long-term safety concerns with the use of DAAs on growth and sexual development in children.[40] In an international, multicenter, observational registry of 426 children 3–17 years of age who were treated with a variety of DAA regimens, including sofosbuvir plus ribavirin, ledipasvir-sofosbuvir +/- ribavirin, sofosbuvir-velpatasvir, or sofosbuvir-velpatasvir-voxilaprevir, there was change in growth or sexual development over a median of 3.7 years of follow-up.[41] Results were comparable when stratified by sex.[41] When stratified by age, there were small decreases in median height, weight and BMI z scores in children in the 3–5 year age group; however, these differences disappeared when restricting the analysis to children with 3 or more years of follow-up.[41]

Adherence Challenges

For children receiving treatment with DAAs, one major adherence challenge, particularly in younger age groups, is the child spitting up the drugs due to a bad taste of the medication or refusing to take the medication due to taste or texture within a food vehicle used to assist in swa. Across all registration trials, however, most children, including those 3–5 years of age, completed the prescribed DAA regimen.[28,29,30,31,32,33] Because the rate of fibrosis progression is slow, medical providers should discuss with parents about making sure the child is ready to take the medication consistently before starting DAAs. This may include some practice with non-medications that have a similar texture.

Immunizations for Children and Adolescents with HCV

Hepatitis A Vaccination

Vaccination against HAV is routinely recommended for all children aged 12–23 months using one of two commercially available 2-dose HepA vaccines given 6 months apart (Table 6).[42] Children and adolescents 2–18 years of age who have not previously been vaccination should also undergo vaccination with the 2-dose series as soon as possible.[42] Persons with chronic HCV who acquire HAV are more likely to have severe manifestations of acute HAV infection, and therefore hepatitis A vaccination is especially important in children with chronic HCV infection.[43] Hepatitis A vaccines are highly immunogenic in children and adolescents, with nearly all individuals achieving protective antibody levels 1 month after receiving the second dose of the hepatitis A vaccine. As such, post-vaccination serologies are not routinely recommended except in the setting of immunosuppression.[42] It should be noted that the combined hepatitis A and B vaccine, *Twinrix*, is not approved for individuals under the age of 18 and should not be given to children and adolescents.[42]

Hepatitis B Vaccination

Vaccination against HBV is routinely recommended for all infants, children, and adolescents, ideally starting at the time of birth. Individuals with HCV who acquire HBV can have a more fulminant acute course and can experience accelerated liver fibrosis, making vaccination against HBV critical in this population.[44]

Hepatitis B Vaccines for Children and Adolescents

There are two single-antigen 3-dose HepB vaccines, Engerix-B and Recombivax-HB, that are approved for use in children and adolescents.[45] In addition, there is an approved combination 3-dose vaccine, *Pediarix*, which also contains diphtheria toxoid, tetanus toxoid, acellular pertussis antigens, and inactivated Poliovirus. In addition, *Vaxelis* is a 3-dose vaccine series that includes hepatitis B, diphtheria, pertussis, tetanus, polio, and Hemophilus influenza type b. *Vaxelis* is administered at 2, 4, and 6 months of age, but the first dose may be given as early as 6 weeks of age. *Vaxelis* can be used to complete the hepatitis B immunization series. The first dose may be given as early as 6 weeks of age (Table 7). Note that neither *Heplisav-B* nor *Twinrix* are approved for use in persons younger than 18 years of age.

Hepatitis B Vaccine Schedule For Children and Adolescents

Older children and adolescents should be vaccinated using 3 doses of Engerix-B or Recombivax-HB, administered at 0, 1, and 6 months. For adolescents 11 to 15 years of age, a 2-dose series with Recombivax-HB can be used if the adult-strength doses are administered.[45] For guidance on vaccination in infants born to mothers with HBV, please see the lesson on Preventing Perinatal Transmission, which is available on the Hepatitis B Online educational site.

Hepatitis B Vaccine Schedule For Infants

For infants, only the single-antigen HepB vaccines are recommended for birth dose; if the single-antigen HepB vaccine is used for all doses, a total of 3 or 4 doses should be given based on the mother's hepatitis B status (Table 8).[45] *Pediarix* and *Vaxelis* can be given as a 3-dose series administered at 2, 4, and 6 months of age; this 3-dose series can be used to complete the HepB vaccination series after a single-antigen HepB birth dose is given. With both *Pediatrix* and *Vaxelis*, the first dose is ideally administered at 2 months of age, but if needed, it can be administered as early as 6 weeks of age. *Pediatrix* can be administered up through 6 years of age and *Vaxelis* up through 5 years of age.

Routine Childhood Vaccinations

Entry into HCV care can be an opportunity to catch-up on routinely recommended childhood vaccinations. A

comprehensive review of all routine childhood vaccinations is beyond the scope of this lesson. For more information, see immunization schedule recommendations from the American Academy of Pediatrics.[46]

Long-Term Monitoring

Monitoring and HCC Screening

Children and adolescents who do not, or cannot, undergo HCV treatment after an initial assessment should have liver biochemistries performed at least annually to assess for disease progression.[25] In addition, children with cirrhosis should undergo routine screening for hepatocellular carcinoma (HCC) every 6 months with liver ultrasound and serum alpha fetoprotein.[25,47] For more information on screening for HCC, please see the Topic Review on Surveillance for Hepatocellular Carcinoma. A test of cure should be performed for all children and adolescents 12 weeks after completion of treatment.

Screening for Other Causes of Liver Disease

Owing to shared risk factors and the need for vaccination against other liver viruses, children and adolescents with HCV should undergo screening for hepatitis A virus (HAV), hepatitis B virus (HBV), and HIV.

- Screening for HAV should be performed using an assay for HAV IgG (anti-HAV IgG). Children and adolescents with HCV who are non-immune to HAV should be vaccinated according to guidelines discussed below.[25]
- Screening for HBV should include obtaining assays for hepatitis B surface antigen (HBsAg), hepatitis B surface antibody (anti-HBs), and hepatitis B core antibody (anti-HBc). Children and adolescents who are not immune to HBV should be vaccinated, according to the guidelines discussed below.[25] Children and adolescents with chronic HBV infection should be referred to a specialist knowledgeable about HBV management.
- Screening for HIV should be performed using the 4th generation HIV antigen/antibody assay. Children and adolescents who screen negative for HIV but have ongoing risk factors for infection should undergo repeat periodic testing.[25,48]

Summary Points

- Between 2014 and 2024, the number of acute and new cases of chronic HCV infections reported to the CDC declined for persons 0–19 years of age.
- Infants and children with confirmed perinatal exposure to HCV should undergo HCV RNA testing at 2-6 months of age.
- Among children with perinatally acquired HCV, approximately 20% to 40% will spontaneously clear the infection by 5 years of age.
- Children with HCV should undergo fibrosis assessment via routine laboratory testing and physical examination, as well as consideration of other modalities including elastography and serum fibrosis markers.
- Direct acting antivirals (DAAs) have been shown to be safe and effective in children as young as 3 years of age, and treatment is recommended for all children and adolescents with chronic HCV infection.
- For treatment naïve or interferon-experienced children and adolescents without cirrhosis or with compensated cirrhosis, the DAA regimens of glecaprevir-pibrentasvir (GT 1-6), sofosbuvir-velpatasvir (GT 1-6), and ledipasvir-sofosbuvir (GT 1,4,5,6) are recommended.
- All DAA regimens that are FDA approved for use in children and adolescents require weight-based dosing.
- Routine vaccination for hepatitis A virus (HAV) and hepatitis B virus (HBV) is recommended for all children and adolescents, starting at 12 months for HAV and at birth for HBV. Persons with chronic HCV who acquire HAV or HBV are more likely to have severe manifestations, and therefore hepatitis A vaccination is especially important in children with chronic HCV.
- Children with cirrhosis should undergo routine screening for hepatocellular carcinoma (HCC) every 6 months with liver ultrasound and serum alpha fetoprotein.
- Owing to shared risk factors and the need for vaccination against other liver viruses, children and adolescents with HCV should undergo screening for HAV, HBV, and HIV.

Citations

1. Indolfi G, Easterbrook P, Dusheiko G, et al. Hepatitis C virus infection in children and adolescents. Lancet Gastroenterol Hepatol. 2019;4:477-87.
[PubMed Abstract] -

2. Centers for Disease Control and Prevention (CDC). Hepatitis C Surveillance 2023. Published April 2025.
[CDC] -

3. Centers for Disease Control and Prevention. HepTracker Dashboard.
[CDC] -

4. Schmelzer J, Dugan E, Blach S, et al. Global prevalence of hepatitis C virus in children in 2018: a modelling study. Lancet Gastroenterol Hepatol. 2020;5:374-92.
[PubMed Abstract] -

5. Li J, Le MH, Barakat MT, Cheung RC, Nguyen MH. The Changing Epidemiology of Liver Disease Among US Children and Adolescents From 1999 to 2016. Am J Gastroenterol. 2021;116:2068-78.
[PubMed Abstract] -

6. Schillie S, Wester C, Osborne M, Wesolowski L, Ryerson AB. CDC Recommendations for Hepatitis C Screening Among Adults - United States, 2020. MMWR Recomm Rep. 2020;69:1-17.
[PubMed Abstract] -

7. Ly KN, Jiles RB, Teshale EH, Foster MA, Pesano RL, Holmberg SD. Hepatitis C Virus Infection Among Reproductive-Aged Women and Children in the United States, 2006 to 2014. Ann Intern Med. 2017;166:775-782.
[PubMed Abstract] -

8. Polywka S, Pembrey L, Tovo PA, Newell ML. Accuracy of HCV-RNA PCR tests for diagnosis or exclusion of vertically acquired HCV infection. J Med Virol. 2006;78:305-10.
[PubMed Abstract] -

9. Hillemanns P, Dannecker C, Kimmig R, Hasbargen U. Obstetric risks and vertical transmission of hepatitis C virus infection in pregnancy. Acta Obstet Gynecol Scand. 2000;79:543-7.
[PubMed Abstract] -

10. Bal A, Petrova A. Single Clinical Practice's Report of Testing Initiation, Antibody Clearance, and Transmission of Hepatitis C Virus (HCV) in Infants of Chronically HCV-Infected Mothers. Open Forum Infect Dis. 2016;3:ofw021.
[PubMed Abstract] -

11. Panagiotakopoulos L, Sandul AL, Conners EE, Foster MA, Nelson NP, Wester C. CDC Recommendations for Hepatitis C Testing Among Perinatally Exposed Infants and Children - United States, 2023. MMWR Recomm Rep. 2023;72:1-21.
[PubMed Abstract] -

12. Mangarelli C, Raghupatruni P, Latimer T, Jhaveri R. Integrating Universal Hepatitis C Screening Into Adolescent Well Visits Is a "Win-Win" Scenario: Rationale and Demonstration of Real-world Feasibility and Implementation. J Pediatric Infect Dis Soc. 2024;13:S166-S170.
[PubMed Abstract] -

13. Leung DH, Squires JE, Jhaveri R, et al. Hepatitis C in 2020: A North American Society for Pediatric

Gastroenterology, Hepatology, and Nutrition Position Paper. J Pediatr Gastroenterol Nutr. 2020;71:407-17.
[PubMed Abstract] -

14. Garazzino S, Calitri C, Versace A, et al. Natural history of vertically acquired HCV infection and associated autoimmune phenomena. Eur J Pediatr. 2014;173:1025-31.
[PubMed Abstract] -

15. European Paediatric Hepatitis C Virus Network. Three broad modalities in the natural history of vertically acquired hepatitis C virus infection. Clin Infect Dis. 2005;41:45-51.
[PubMed Abstract] -

16. Ades AE, Gordon F, Scott K, et al. Overall Vertical Transmission of Hepatitis C Virus, Transmission Net of Clearance, and Timing of Transmission. Clin Infect Dis. 2023;76:905-12.
[PubMed Abstract] -

17. Bortolotti F, Verucchi G, Cammà C, et al. Long-term course of chronic hepatitis C in children: from viral clearance to end-stage liver disease. Gastroenterology. 2008;134:1900-7.
[PubMed Abstract] -

18. García-Monzón C, Jara P, Fernández-Bermejo M, et al. Chronic hepatitis C in children: a clinical and immunohistochemical comparative study with adult patients. Hepatology. 1998;28:1696-701.
[PubMed Abstract] -

19. Mizuochi T, Takano T, Yanagi T, et al. Epidemiologic features of 348 children with hepatitis C virus infection over a 30-year period: a nationwide survey in Japan. J Gastroenterol. 2018;53:419-26.
[PubMed Abstract] -

20. Rerksuppaphol S, Hardikar W, Dore GJ. Long-term outcome of vertically acquired and post-transfusion hepatitis C infection in children. J Gastroenterol Hepatol. 2004;19:1357-62.
[PubMed Abstract] -

21. Modin L, Arshad A, Wilkes B, et al. Epidemiology and natural history of hepatitis C virus infection among children and young people. J Hepatol. 2019;70:371-8.
[PubMed Abstract] -

22. Guido M, Bortolotti F, Jara P, et al. Liver steatosis in children with chronic hepatitis C. Am J Gastroenterol. 2006;101:2611-5.
[PubMed Abstract] -

23. Claret-Teruel G, Noguera-Julian A, Esteva C, et al. Impact of human immunodeficiency virus coinfection on the progression of mother-to-child transmitted hepatitis C virus infection. Pediatr Infect Dis J. 2011;30:801-4.
[PubMed Abstract] -

24. Pokorska-Śpiewak M, Kowalik-Mikołajewska B, Aniszewska M, Walewska-Zielecka B, Marczyńska M. The influence of hepatitis B and C virus coinfection on liver histopathology in children. Eur J Pediatr. 2015;174:345-53.
[PubMed Abstract] -

25. AASLD-IDSA. HCV Guidance: Recommendations for testing, management, and treating hepatitis C. Unique populations: HCV in children
[AASLD/IDSA Hepatitis C Guidance] -

26. Sterling RK, Duarte-Rojo A, Patel K, et al. AASLD Practice Guideline on imaging-based noninvasive liver disease assessment of hepatic fibrosis and steatosis. Hepatology. 2025;81:672-724. [PubMed Abstract] -

27. Sterling RK, Patel K, Duarte-Rojo A, et al. AASLD Practice Guideline on blood-based noninvasive liver disease assessment of hepatic fibrosis and steatosis. Hepatology. 2025;81:321-57. [PubMed Abstract] -

28. Jonas MM, Squires RH, Rhee SM, et al. Pharmacokinetics, Safety, and Efficacy of Glecaprevir/Pibrentasvir in Adolescents With Chronic Hepatitis C Virus: Part 1 of the DORA Study. Hepatology. 2020;71:456-62. [PubMed Abstract] -

29. Jonas MM, Rhee S, Kelly DA, et al. Pharmacokinetics, Safety, and Efficacy of Glecaprevir/Pibrentasvir in Children With Chronic HCV: Part 2 of the DORA Study. Hepatology. 2021;74:19-27. [PubMed Abstract] -

30. Jonas MM, Romero R, Rosenthal P, et al. Sofosbuvir-velpatasvir in children 3-17 years old with hepatitis C virus infection. J Pediatr Gastroenterol Nutr. 2024;78:1342-54. [PubMed Abstract] -

31. Balistreri WF, Murray KF, Rosenthal P, et al. The safety and effectiveness of ledipasvir-sofosbuvir in adolescents 12-17 years old with hepatitis C virus genotype 1 infection. Hepatology. 2017;66:371-8. [PubMed Abstract] -

32. Murray KF, Balistreri WF, Bansal S, et al. Safety and Efficacy of Ledipasvir-Sofosbuvir With or Without Ribavirin for Chronic Hepatitis C in Children Ages 6-11. Hepatology. 2018;68:2158-66. [PubMed Abstract] -

33. Schwarz KB, Rosenthal P, Murray KF, et al. Ledipasvir-Sofosbuvir for 12 Weeks in Children 3 to World Health Organization. Updated recommendations on treatment of adolescents and children with chronic HCV infection, and HCV simplified service delivery and diagnostics. Geneva: World Health Organization. October 17, 2022.Abdel Ghaffar TY, El Naghi S, Abdel Gawad M, et al. Safety and efficacy of combined sofosbuvir/daclatasvir treatment of children and adolescents with chronic hepatitis C Genotype 4. J Viral Hepat. 2019;26:263-70.El-Shabrawi M, Baroudy S, Hassanin F, Behairy AS, Yakoot M, Ahmed A. Follow-up of chronic paediatric hepatitis C virus in a low-/middle-income country. Acta Paediatr. 2020;109:2699-2705.Yakoot M, El-Shabrawi MH, AbdElgawad MM, et al. Dual Sofosbuvir/Daclatasvir Therapy in Adolescent Patients With Chronic Hepatitis C Infection. J Pediatr Gastroenterol Nutr. 2018;67:86-9.Bhattacharya D, Aronsohn A, Price J, Lo Re V. Hepatitis C Guidance 2023 Update: AASLD-IDSA Recommendations for Testing, Managing, and Treating Hepatitis C Virus Infection. Clin Infect Dis. 2023;ciad319.Indolfi G, Easterbrook P, Giometto S, Malik F, Chou R, Lucenteforte E. Efficacy and safety of DAA in children and adolescents with chronic HCV infection: A systematic review and meta-analysis. Liver Int. 2024;44:663-81.Jonas MM, Balistreri W, Gonzalez-Peralta RP, et al. Pegylated interferon for chronic hepatitis C in children affects growth and body composition: results from the pediatric study of hepatitis C (PEDS-C) trial. Hepatology. 2012;56:523-31.Gonzalez-Peralta RP, Wen JW, Hardikar W, et al. Long-term efficacy and safety of sofosbuvir-based direct-acting antiviral regimens in paediatric patients with hepatitis C virus infection: an international registry study. Lancet Child Adolesc Health. 2025;9:248-54.Nelson NP, Weng MK, Hofmeister MG, et al. Prevention of Hepatitis A Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices, 2020. MMWR Recomm Rep. 2020;69:1-38.Vento S, Garofano T, Renzini C, et al. Fulminant hepatitis associated with hepatitis A virus superinfection in patients with chronic hepatitis C. N Engl J Med. 1998;338:286-90.Sagnelli E, Coppola N, Pisaturo M, et al. HBV superinfection in HCV chronic carriers: a disease that is frequently severe but associated with the eradication of HCV. Hepatology. 2009;49:1090-7.Schillie S, Vellozzi C,

Reingold A, et al. Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices. MMWR Recomm Rep. 2018;67:1-31.American Academy of Pediatrics. Recommended Child and Adolescent Immunization Schedule for Ages 18 Years or Younger, United States, 2026.Singal AG, Llovet JM, Yarchoan M, et al. AASLD Practice Guidance on prevention, diagnosis, and treatment of hepatocellular carcinoma. Hepatology. 2023;78:1922-65.Horberg M, Thompson M, Agwu A, et al. Primary Care Guidance for Providers of Care for Persons With Human Immunodeficiency Virus: 2024 Update by the HIV Medicine Association of the Infectious Diseases Society of America. Clin Infect Dis. 2024 Oct 12:ciae479.

References

- Ades AE, Gordon F, Scott K, et al. Spontaneous Clearance of Vertically Acquired Hepatitis C Infection: Implications for Testing and Treatment. Clin Infect Dis. 2023;76:913-91. [PubMed Abstract] -
- Awad Mel-D, Shiha GE, Sallam FA, Mohamed A, El Tawab A. Evaluation of liver stiffness measurement by fibroscan as compared to liver biopsy for assessment of hepatic fibrosis in children with chronic hepatitis C. J Egypt Soc Parasitol. 2013;43:805-19. [PubMed Abstract] -
- Benova L, Mohamoud YA, Calvert C, Abu-Raddad LJ. Vertical transmission of hepatitis C virus: systematic review and meta-analysis. Clin Infect Dis. 2014;59:765-73. [PubMed Abstract] -
- El-Sayed R, Fahmy M, El Koofy N, et al. Can aspartate aminotransferase to platelet ratio index replace liver biopsy in chronic hepatitis C? Trop Gastroenterol. 2011;32:267-72. [PubMed Abstract] -
- El-Shabrawi MH, Mohsen NA, Sherif MM, et al. Noninvasive assessment of hepatic fibrosis and necroinflammatory activity in Egyptian children with chronic hepatitis C virus infection using FibroTest and ActiTest. Eur J Gastroenterol Hepatol. 2010;22:946-51. [PubMed Abstract] -
- Hwang JY, Yoon HM, Kim JR, et al. Diagnostic Performance of Transient Elastography for Liver Fibrosis in Children: A Systematic Review and Meta-Analysis. AJR Am J Roentgenol. 2018;211:W257-W266. [PubMed Abstract] -
- Page CM, Hughes BL, Rhee EHJ, Kuller JA. Hepatitis C in Pregnancy: Review of Current Knowledge and Updated Recommendations for Management. Obstet Gynecol Surv. 2017;72:347-55. [PubMed Abstract] -
- Patrick SW, Dupont WD, McNeer E, et al. Association of Individual and Community Factors With Hepatitis C Infections Among Pregnant People and Newborns. JAMA Health Forum. 2021;2:e213470. [PubMed Abstract] -
- Post JJ. Update on hepatitis C and implications for pregnancy. Obstet Med. 2017;10:157-60. [PubMed Abstract] -

Figures

Figure 1 HCV Infections in Persons 0-19 Years of Age, United States

Note: Data for 2024 are provisional data.

Source: Centers for Disease Control and Prevention. HepTracker Dashboard.

This is a dynamic visualization. Please visit our website to experience this dynamic content.

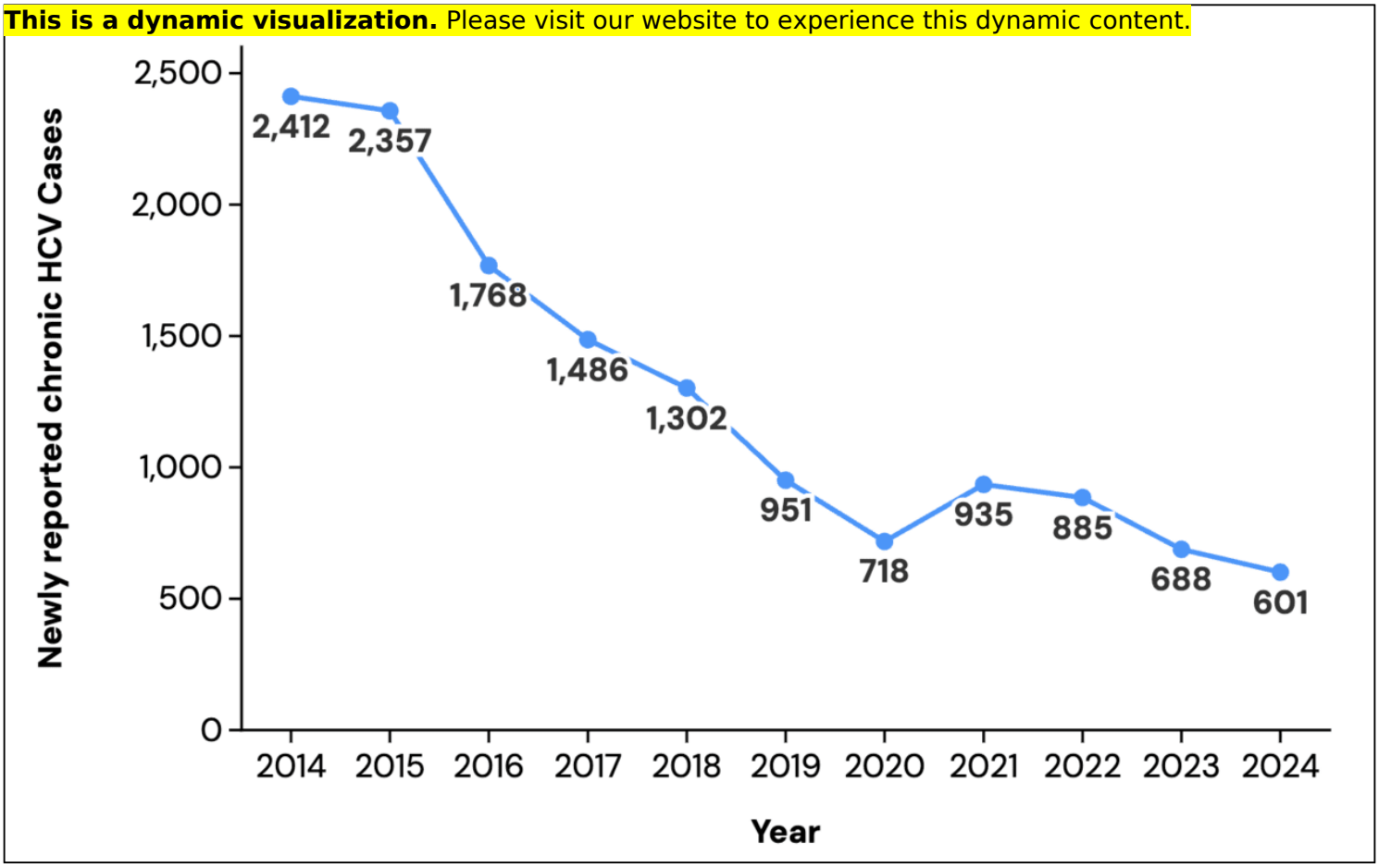

Figure 2 Number of Reported Perinatal HCV Infections, United States, 2018-2024

Source: Centers for Disease Control and Prevention. HepTracker Dashboard.

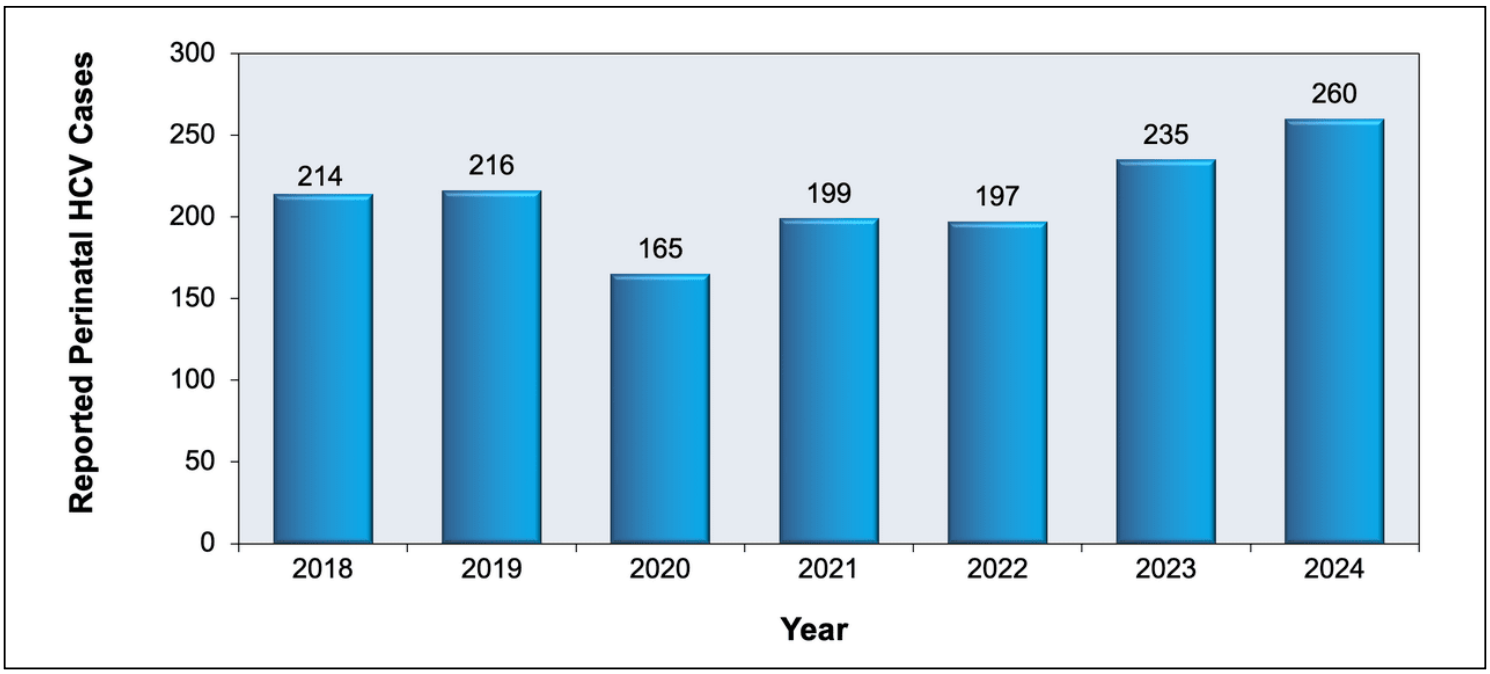

Figure 3 Anti-HCV among Infants Born to Mothers with HCV Infection: Clearance of Maternal Antibody in Children not Infected with HCV

Source: European Paediatric Hepatitis C Virus Network. A significant sex--but not elective cesarean section--effect on mother-to-child transmission of hepatitis C virus infection. J Infect Dis. 2005;192:1872-9.

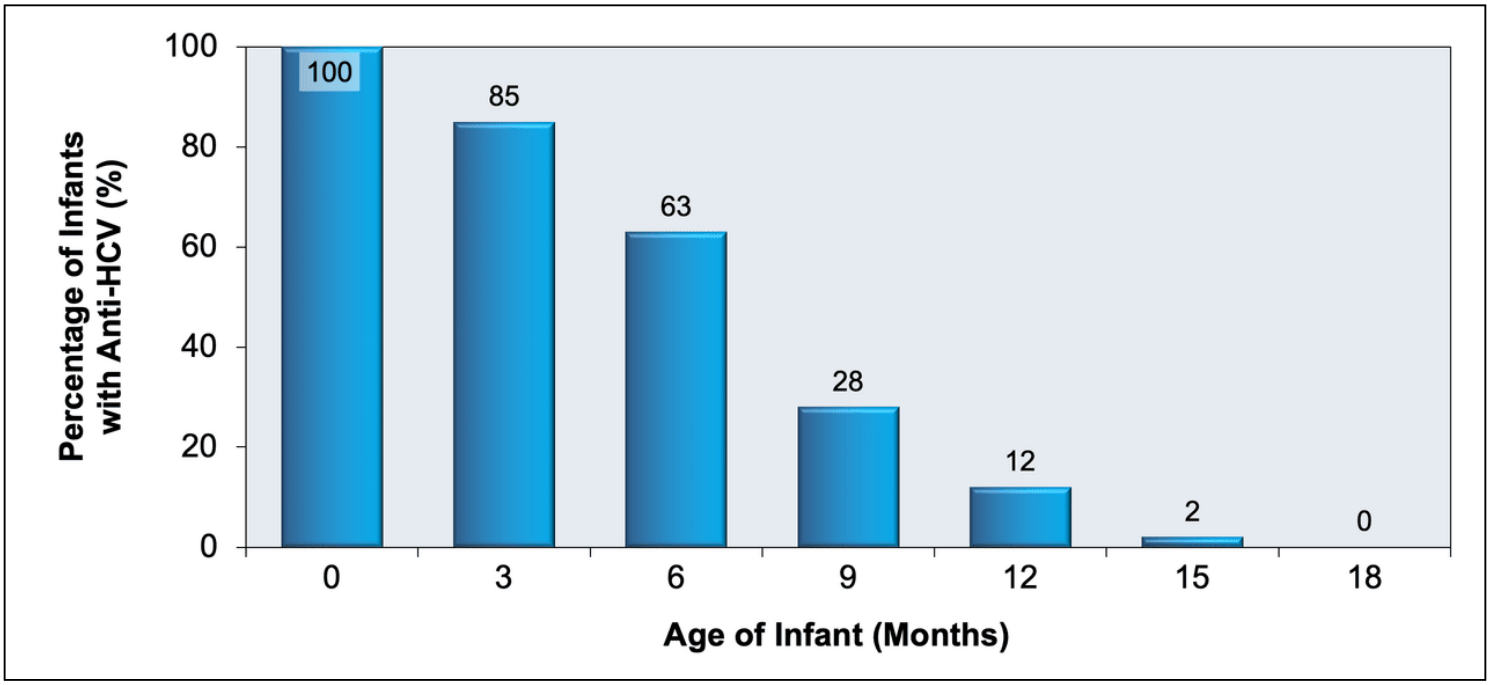

Figure 4 Algorithm for HCV Testing of Perinatally Exposed Children, United States

Abbreviations: NAT = nucleic acid test

Source: Panagiotakopoulos L, Sandul AL, Conners EE, Foster MA, Nelson NP, Wester C. CDC Recommendations for Hepatitis C Testing Among Perinatally Exposed Infants and Children - United States, 2023. MMWR Recomm Rep. 2023;72:1-21.

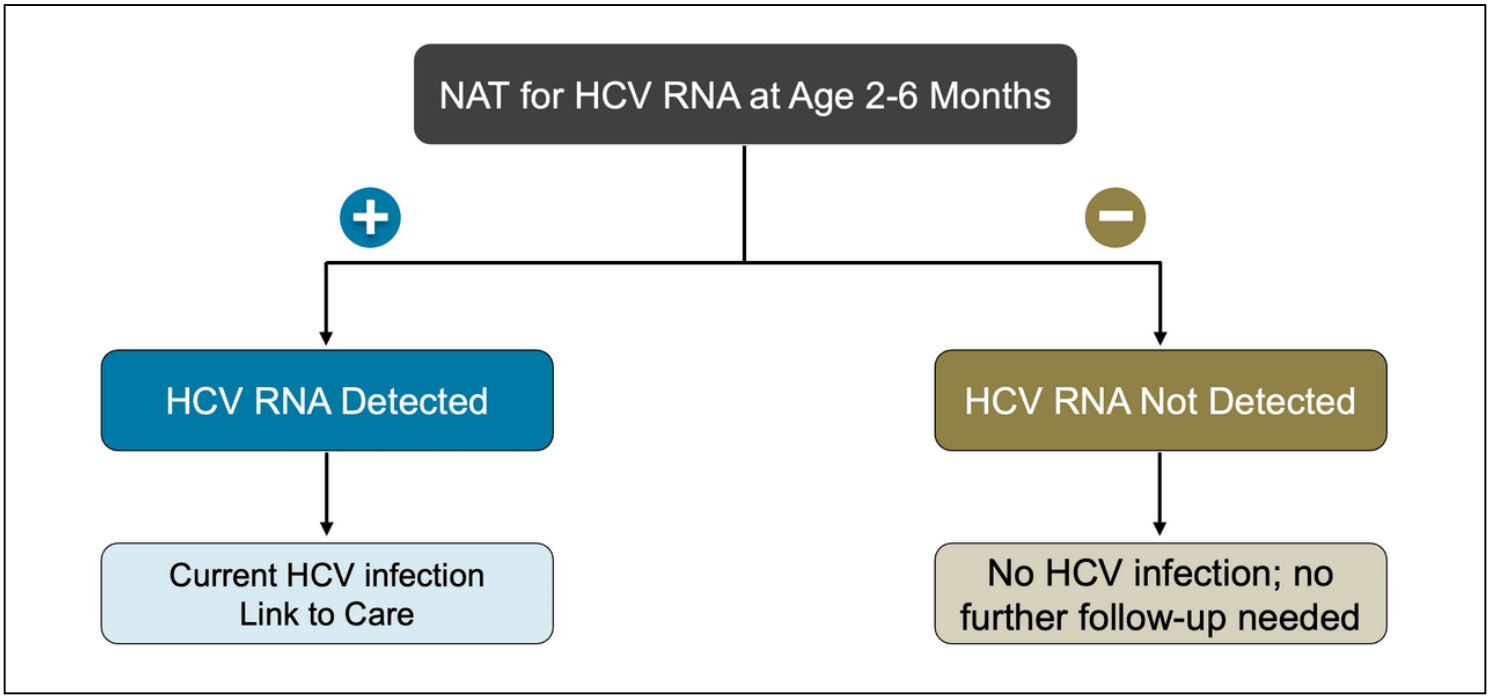

Table 1. Initial Treatment of HCV in Pediatric Patients Aged ≥3 Years

AASLD/IDSA Hepatitis C Guidance: HCV in Children Treatment-Naive or Interferon-Experienced Children and Adolescents Without Cirrhosis or with Compensated Cirrhosis[a]				
	Regimen (weight-based dosing)	Genotype	Duration	Ra
	Glecaprevir-pibrentasvir[b]	1-6	8 weeks	
	Sofosbuvir-velpatasvir	1-6	12 weeks	
	Ledipasvir-sofosbuvir	1, 4, 5, 6	12 weeks	
	[a]Child-Pugh A [b]Longer duration of therapy (ie, 16 weeks) may be needed for genotype 3 interferon-experienced patients Regimens are listed by genotypic activity, evidence level, and alphabetically.			

Source:

- AASLD-IDSA. HCV Guidance: Recommendations for testing, management, and treating hepatitis C. Unique populations: HCV in children [AASLD/IDSA Hepatitis C Guidance]

Table 2. Retreatment of HCV in Pediatric Patients

AASLD/IDSA Hepatitis C Guidance: HCV in Children Retreatment of HCV in Pediatric Patients by Exposure Category and Cirrhosis Status	Regimen
	Interferon (+/- ribavirin) and/or sofosbuvir treatment failure but no exposure to NS3/4A or NS5A protease inhibitor
	Glecaprevir-pibrentasvir
	Glecaprevir-pibrentasvir
	Glecaprevir-pibrentasvir
	Sofosbuvir-velpatasvir
	Sofosbuvir-velpatasvir + weight-based ribavirin
	NS3/4A protease inhibitor treatment failure without NS5A inhibitor exposure
	Glecaprevir-pibrentasvir
	NS5A inhibitor treatment failure without NS3/4A protease inhibitor exposure
	Glecaprevir-pibrentasvir
	Interferon (+/- ribavirin) plus an HCV protease inhibitor treatment failure
	Ledipasvir-sofosbuvir
	Ledipasvir-sofosbuvir
	Ledipasvir-sofosbuvir
	[a]Child-Pugh A Regimens are listed according t alphabetical orderr. Evidence Rating I = Evidence and/or general ag procedure, or treatment is bene II = Conflicting evidence and/or efficacy of a diagnostic evaluat IIa = Weight of evidence and/or IIb = Usefulness and efficacy ar III = Conditions for which there diagnostic evaluation, procedur some cases may be harmful.

Source:

- AASLD-IDSA. HCV Guidance: Recommendations for testing, management, and treating hepatitis C. Unique populations: HCV in children [AASLD/IDSA Hepatitis C Guidance]

Table 3. WHO Treatment Guidelines for Children and Adolescents

Age Groups	Pangenotypic DAA Regimens			Non-pangenotyp regimen (in setti with minimal GT infection)[2]
	Sofosbuvir daclatasvir*[1]	Sofosbuvir-velpatasvir[2]	Glecapavir pibrentasvir	Sofosbuvir ledipasvir[2]
Adults (≥18 yrs)	12 weeks	12 weeks	8 weeks	12 week
Adolescents (12-17 years)	12 weeks	12 weeks	8 weeks	12 weeks
Older children (6-11 years)	12 weeks	12 weeks	8 weeks	12 weeks
Younger children (3-5 years)	12 weeks	12 weeks	8 weeks	12 weeks

*Note: daclatasvir is no longer manufactured in the United States. Sofosbuvir-daclatasvir, as a fixed-dose combinati individual tablets, is available in many countries; however, the fixed-dose combination is not approved for use in th States.
[1] In those without cirrhosis. Treatment for 24 weeks is recommended in those who are treatment experienced or wi compensated cirrhosis. May be considered in settings where genotype 3 is known to be highly prevalent (>10%).
[2] For use in those with genotype 1, 4, 5, or 6 infection
Abbreviations: DAA = directing-acting antivirals; GT = genotype

Source:

- World Health Organization. Updated recommendations on treatment of adolescents and children with chronic HCV infection, and HCV simplified service delivery and diagnostics. Geneva: World Health Organization. October 17, 2022. [WHO]

Table 4. HCV Medications in Children Aged ≥3 Years

AASLD/IDSA Hepatitis C Guidance: HCV in Children Weight-Based Dosing of HCV Treatment Medications in Children Aged ≥3 Years	Body Weight	
	Once Daily Dose of Glecaprevir-Pibrentasvir (for children aged ≥3 years)	
	<20 kg	
	≥20 kg to <30 kg	
	≥30 kg to <45 kg	
	≥45 kg *or* ≥12 years of age	
	Once Daily Dose of Sofosbuvir-Velpa aged ≥3 years)	
	<17 kg	
	17 to<30 kg	
	≥30 kg	
	Once Daily Dose of Ledipasvir-Sofosbuvir (for children aged ≥3 years)	
	<17 kg	
	17 to<35 kg	
	≥35 kg	
	Total Daily Dose of Ribavirin (for children aged ≥3 years)	
	<47 kg	
	47 to 49 kg	
	50 to 65 kg	
	66 to 80 kg	
	>80 kg	

Source:

- AASLD-IDSA. HCV Guidance: Recommendations for testing, management, and treating hepatitis C. Unique populations: HCV in children [AASLD/IDSA Hepatitis C Guidance]

Table 5. Weight-Based Dosing of Sofosbuvir-Daclatasvir

Weight-Based Dosing of Sofosbuvir-Daclatasvir* (for children ≥3 Years of Age)	Weight	Once-Daily Dose of Sofosbuvir/Daclatasvir
	14-25 kg	
	>26 kg	
	*Note that daclatasvir is no longer m combination or as individual tablets, not approved for use in the United St	

Source:

- World Health Organization. Updated recommendations on treatment of adolescents and children with chronic HCV infection, and HCV simplified service delivery and diagnostics. Geneva: World Health Organization. October 17, 2022. [WHO]

Table 6. Recommended Hepatitis A Vaccine Doses and Schedule for Children

Hepatitis A Vaccine	Age Group	Dosage	Dosing and Route
Havrix	1-18 years	720 ELISA units	2-Dose Schedule: 0.5 mL given IM at 0 and 6–1
Vaqta	1-18 years	25 units	2-Dose Schedule: 0.5 mL given IM at 0 and 6–1
Abbreviations: IM = intramuscular			

Source:

- Nelson NP, Weng MK, Hofmeister MG, et al. Prevention of Hepatitis A Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices, 2020. MMWR Recomm Rep. 2020;69:1-38. [PubMed Abstract]

Table 7. Hepatitis B Single-Antigen Vaccines and Doses in Children and Adolescents

Age group	***Recombivax-HB***		***Engerix-B***	
	Dose (µg)	Vol (mL)	Dose	Vol (mL)
Standard Dosing				
Birth-10 years	5	0.5	10	0.5
11-15 years	10	1	N/A	N/A
15-19 years	5	0.5	10	0.5
Dosing in Hemodialysis Patients and Other Immunocompromised Persons				
<20 years	5	0.5	10	0.5

Table 8. Hepatitis B Vaccine Schedules for Infants, by Infant Birthweight and Maternal HBsAg Status

Maternal HBsAg Status	Single-Antigen Vaccine Dose: Age	Single-Antigen + Combinatio Dose: Age
Birth-weight ≥2,000 grams		
Positive	Dose 1: At birth (≤12 hours of age) HBIG[§]: At birth (≤12 hours of age) Dose 2: At age 1-2 months Dose 3: At age 6 months[¶]	Dose 1: At birth (≤12 hours HBIG: At birth (≤12 hours o Dose 2: At age 2 months Dose 3: At age 4 months Dose 4: At age 6 months[¶]
Unknown*	Dose 1: At birth (≤12 hours) Dose 2: At age 1-2 months Dose 3: At age 6 months[¶]	Dose 1: At birth (≤12 hours) Dose 2: At age 2 months Dose 3: At age 4 months Dose 4: At age 6 months[¶]
Negative	Dose 1: At birth (≤24 hours) Dose 2: At age 1-2 months Dose 3: At age 6-18 months[¶]	Dose 1: At birth (≤24 hours) Dose 2: At age 2 months Dose 3: At age 4 months Dose 4: At age 6 months[¶]
Birth-weight <2,000 grams		
Positive	Dose 1: At birth (≤12 hours of age) HBIG: At birth (≤12 hours of age) Dose 2: At age 1 months Dose 3: At age 2-3 months Dose 4: At age 6 months[¶]	Dose 1: At birth (≤12 hours HBIG: At birth (≤12 hours o Dose 2: At age 2 months Dose 3: At age 4 months Dose 4: At age 6 months[¶]
Unknown	Dose 1: At birth (≤12 hours of age) HBIG: At birth (≤12 hours of age) Dose 2: At age 1 months Dose 3: At age 2-3 months Dose 4: At age 6 months[¶]	Dose 1: At birth (≤12 hours HBIG: At birth (≤12 hours o Dose 2: At age 2 months Dose 3: At age 4 months Dose 4: At age 6 months[¶]
Negative	Dose 1: At Hospital Discharge or age 1 month Dose 2: At age 2 months Dose 3: At age 6-18 months[¶]	Dose 1: At Hospital Discharg Dose 2: At age 2 months Dose 3: At age 4 months Dose 4: At age 6 months[¶]

Abbreviations: HBsAg = hepatitis B surface antigen; HBIG = hepatitis B immune globulin
*Mothers should have blood drawn and tested for HBsAg as soon as possible after admission for delivery; if the mot HBsAg positive, the infant should receive HBIG as soon as possible but no later than age 7 days.
^*Pediarix* and *Vaxelis* should not be administered before age 6 weeks.
[§]HBIG should be administered at a separate anatomical site from vaccine.
[¶]The final dose in the vaccine series should not be administered before age 24 weeks (164 days).

Source:

- Schillie S, Vellozzi C, Reingold A, et al. Prevention of Hepatitis B Virus Infection in the United States: Recommendations of the Advisory Committee on Immunization Practices. MMWR Recomm Rep. 2018;67:1-31. [PubMed Abstract]