



Body System: Gastrointestinal		
Session Topic: Hepatitis A, B, and C Prevention and Treatment		
Educational Format		Faculty Expertise Required
REQUIRED	Interactive Lecture	Expertise in the field of study. Experience teaching in the field of study is desired. Preferred experience with audience response systems (ARS). Utilizing polling questions and engaging the learners in Q&A during the final 15 minutes of the session are required.
OPTIONAL	Problem-Based Learning (PBL)	Expertise teaching highly interactive, small group learning environments. Case-based, with experience developing and teaching case scenarios for simulation labs preferred. Other workshop-oriented designs may be accommodated. A typical PBL room is set for 50-100 participants, with 7-8 each per round table. <u>Please describe your interest and plan for teaching a PBL on your proposal form.</u>
Professional Practice Gap	Learning Objective(s) that will close the gap and meet the need	Outcome Being Measured
<ul style="list-style-type: none"> • Vaccination rates among U.S. adults are suboptimal for vaccine-preventable diseases (VPD). • Family physicians have a knowledge gap related to the utilization of hepatitis vaccination schedules for patients at high risk for developing infection • Physicians often have knowledge and performance gaps in using available patient education resources to counsel patients about vaccine safety and efficacy. • Family physicians have knowledge gap related to hepatitis viral infection treatment, particularly for patients as high risk for developing infection • There are new CDC guidelines on the management of sexually transmitted infections • There are new interferon- 	<ol style="list-style-type: none"> 1. Follow current AAFP immunization schedules and preventive service recommendations for prevention of hepatitis infection. 2. Identify high-risk patients who should be screened for a hepatitis infection, and considered for hepatitis vaccination. 3. Counsel adult patients, and parents of children and adolescents, using available patient education resources and motivational interviewing about vaccine safety and efficacy. 4. Order appropriate laboratory and/or diagnostic tests to confirm diagnosis. 5. Construct an appropriate treatment plan for an adult patient with a confirmed diagnosis, taking into account tailoring of the treatment regimen for the individual, patient-specific barriers to treatment, follow-up monitoring, and making an appropriate referral. 	Learners will submit written commitment to change statements on the session evaluation, indicating how they plan to implement presented practice recommendations.



free treatments available		
ACGME Core Competencies Addressed (select all that apply)		
X	Medical Knowledge	Patient Care
	Interpersonal and Communication Skills	Practice-Based Learning and Improvement
X	Professionalism	Systems-Based Practice
Faculty Instructional Goals		
<p>Faculty play a vital role in assisting the AAFP to achieve its mission by providing high-quality, innovative education for physicians, residents and medical students that will encompass the art, science, evidence and socio-economics of family medicine and to support the pursuit of lifelong learning. By achieving the instructional goals provided, faculty will facilitate the application of new knowledge and skills gained by learners to practice, so that they may optimize care provided to their patients.</p> <ul style="list-style-type: none"> • Provide up to 3 evidence-based recommended practice changes that can be immediately implemented, at the conclusion of the session; including SORT taxonomy & reference citations • Facilitate learner engagement during the session • Address related practice barriers to foster optimal patient management • Provide recommended journal resources and tools, during the session, from the American Family Physician (AFP), Family Practice Management (FPM), and Familydoctor.org patient resources; those listed in the <u>References</u> section below are a good place to start <ul style="list-style-type: none"> ○ Visit http://www.aafp.org/journals for additional resources ○ Visit http://familydoctor.org for patient education and resources • Provide strategies for keeping up to date on current evidence-based preventive care recommendations. • Provide specific case-based scenarios that illustrate hepatitis vaccination management in high-risk patient populations. • Provide specific examples to assist physician-learners in optimally managing their participation in childhood immunization programs (adult, child, & adolescent patients). • Provide specific strategies and resources to assist physician-learners to counsel patients, and parents of children, using available patient education resources and motivational interviewing about vaccine safety and efficacy (adult, child, & adolescent patients). • Provide recommendations for ordering appropriate laboratory and/or diagnostic tests to confirm diagnosis, including strategies for analysis of results. • Provide strategies and resources for constructing an appropriate treatment plan for an adult patient with a confirmed diagnosis, taking into account tailoring of the treatment regimen for the individual, patient-specific barriers to treatment, follow-up monitoring, and making an appropriate referral. • Provide an overview of all relevant guideline updates. • Provide an overview on the safety and efficacy of new treatments. • Provide recommendations regarding guidelines for Medicare reimbursement. • Provide recommendations to maximize office efficiency and guideline adherence for vaccinations, screening, and treatment of hepatitis. • Provide an overview of newly available treatments, including efficacy, safety, contraindications, and cost/benefit relative to existing treatments. • Provide instructions regarding the incorporation and use of the PCMH/ACO/Primary Care Core Measure Set into practice. 		



Needs Assessment:

While immunizations and public health surveillance have greatly reduced infection with hepatitis A virus (HAV), B virus (HBV), and C virus (HCV), there were 1,398 reported cases of HAV in 2011; currently between 800,000 to 1.4 million persons living with chronic hepatitis B viral (HBV) infection, with 38,000 new cases in 2010; and an estimated 3.2 million person in the U.S. with chronic HCV infection.^{1,2} While the overall incidence of acute HBV has declined steadily from a peak of 287,000 cases in 1987 to 38,000 in 2010, HBV remains the most common, but preventable serious liver infection in the world, with an estimated 3,000 deaths annually from chronic liver disease associated with HBV.^{2,3} Although substantial progress in reduction of the burden of vaccine-preventable diseases has been made, continued cases and outbreaks of these diseases persist, driven by various contributing factors; recent outbreaks of measles, polio, influenza, and other preventable diseases are partly due to gaps in resistance within the population.^{4,5} Patients refuse vaccination for a wide number of reasons, including concerns about its efficacy or necessity, fear of side effects, and distrust of medicine in general.⁶ Additionally, vaccination rates among U.S. adults are suboptimal for vaccine-preventable diseases (VPD).^{7,8}

Data from a recent American Academy of Family Physicians (AAFP) CME Needs Assessment survey indicate that family physicians have knowledge gaps with regard to prevention and management of infectious hepatitis A, B, & C.⁹ More specifically, CME outcomes data from the 2011, 2012, 2014, and 2015 AAFP FMX (formerly Assembly) sessions on hepatitis topics suggest that physicians have knowledge and practice gaps with regard to being up to date on current screening and vaccination guidelines; being up to date on current treatment options; appropriate use of diagnostic testing; counseling patients regarding risk reduction; and interpretation of serology results.¹⁰⁻¹³

Family physicians should be aware of medications for the treatment of HBV infection, and be prepared to address viral resistance.¹⁴⁻¹⁶ Goals of treatment for chronic HBV infection are to reduce inflammation of the liver and to prevent complications by suppressing viral replication.¹⁴ Family physicians should establish follow-up for chronic HBV infected patients to monitor for disease activity with liver enzyme tests and HBV DNA levels, consider liver biopsy, and entrance into a surveillance program for hepatocellular carcinoma.¹⁴

There are numerous barriers to achieving optimal vaccination rates, including low patient health literacy and understanding of vaccine safety and efficacy; organizational barriers such as cost, insurance coverage; and operational barriers such as not stocking all recommended vaccinations and lack of standing orders.¹⁷⁻²² Physicians can often improve immunization rates by simply making the recommendation to their patients.⁶ Physicians can minimize costs and maximize reimbursement by systematic comparison pricing, looking for ordering discounts, and using appropriate coding/billing practices.²³ Additionally, physicians can help low-income patients receive free vaccines through the federal *Vaccines for Children (VFC)* program.^{23,24}

In 2010, over 207 million office visits for preventive care were made to primary care providers.²⁵ These preventive care office visits provide family physicians the perfect opportunity to provide HBV vaccinations and information to patients about prevention. The American Academy of



Family Physicians (AAFP) *recommends against* routinely screening the general asymptomatic population for chronic HBV infection. However, the AAFP *recommends* screening for HBV in pregnant women at their first prenatal visit, and has established immunization schedules for HBV vaccination from birth to adulthood.²⁶ Family physicians should be familiar with the AAFP HAV/HBV/HCV immunization schedules.²⁷ Physicians can increase immunization rates by establishing an efficient immunization program in their office, which includes being up to date on the Current Procedural Terminology (CPT) vaccine codes.^{28,29}

While the AAFP recommends against routinely screening the general asymptomatic population for HBV infection; there does exist a gap in the utilization of HBV vaccination and HBV antiviral medications patients at high risk of developing infection, such as:^{14,30-40}

- Psoriatic patients receiving tumor necrosis factor inhibiting agents
- Have chemotherapy-induced immunosuppression
- Have inflammatory bowel disease
- Children and adolescents younger than 19 years who have not been vaccinated previously
- Health care and public safety workers at risk of exposure to blood or blood-contaminated body fluids
- Injection drug users
- Men who have sex with men
- Persons seeking evaluation or treatment for a sexually transmitted infection
- Persons seeking protection from HBV infection (acknowledgment of a specific risk factor is not a requirement for vaccination)
- Persons with chronic liver disease; end-stage renal disease (including predialysis, peritoneal dialysis, hemodialysis, and home dialysis); or human immunodeficiency virus infection
- Residents and staff of facilities for persons who are developmentally disabled
- Sexually active persons who are not in a long-term, mutually monogamous relationship (e.g., persons with more than one sex partner during the past six months)
- Susceptible household contacts or sex partners of persons identified as HBsAg positive
- Travelers to regions with intermediate or high rates of endemic HBV infection

On May 27, the U.S. Preventive Services Task Force (USPSTF) issued a recommendation that screening for hepatitis B virus (HBV) infection should be performed in people at high risk for infection. The AAFP agreed with the USPSTF stance in its own recommendation to screen people at high risk for HBV infection. But it also continues to recommend against screening the low-risk, general asymptomatic population for chronic HBV infection. Current AAFP Clinical Preventive Service Recommendations for hepatitis are summarized as follows:⁴¹

Hepatitis B Virus Infection, Pregnant Women

- The AAFP *recommends* screening for hepatitis B virus (HBV) in pregnant women at their first prenatal visit. (2009) (Grade: A recommendation)

Hepatitis B Virus Infection, in Nonpregnant Adolescents and Adults

- The AAFP *recommends* screening for hepatitis B virus (HBV) infection in persons at high risk for infection. (2014) (Grade: B recommendation)

Hepatitis B Virus Chronic Infection



- The AAFP *recommends against* routinely screening the general asymptomatic population for chronic hepatitis B virus infection. (2014) (Grade: D recommendation)

Hepatitis C Virus Infection, Adults

- The AAFP *recommends* screening for hepatitis C virus (HCV) infection in persons at high risks for infection. The AAFP also recommends offering one-time screening for HCV infection to adults born between 1945 and 1965. (2013) (Grade: B recommendation)

Physicians may improve prevention against hepatitis and their care of patients with hepatitis infections by engaging in continuing medical education that provides practical integration of current evidence-based guidelines and recommendations into their standards of care, including, but not limited to the following:^{14,42-44}

- Periodic HCV screening is recommended in all adults at high risk of infection, and one-time screening is recommended in adults born between 1945 and 1965.
- Confirmation of chronic HCV infection is recommended using qualitative HCV RNA measurement.
- Patients should be assessed for quantitative HCV RNA and genotype before initiating antiviral therapy.
- All patients with chronic HCV infection should be assessed for the degree of liver fibrosis and cirrhosis.
- Ledipasvir/sofosbuvir (Harvoni); ombitasvir/paritaprevir/ritonavir plus dasabuvir (Viekira Pak) with or without weight-based ribavirin (Rebetol); or sofosbuvir (Sovaldi) plus simeprevir (Olysio) with or without weight-based ribavirin is recommended for the treatment of chronic HCV genotype 1.
- All patients with chronic HCV infection should be assessed for alcohol use.
- Vaccination against hepatitis A and B is recommended for susceptible patients with HCV infection.
- Do not repeat hepatitis C viral load testing outside of antiviral therapy.
- Hepatitis A vaccine should be given to all children 12 to 23 months of age.
- Persons who have recently been exposed to hepatitis A virus and have not been immunized should receive a single dose of single-antigen hepatitis A vaccine, or immunoglobulin as an alternative.
- Healthy persons between 12 months and 40 years of age should receive the hepatitis A vaccine.
- Children younger than 12 months, persons 40 years and older, immunocompromised persons, and persons with chronic liver disease or for whom the vaccine is contraindicated, should receive immunoglobulin.
- All susceptible persons traveling outside of the United States, with the exceptions of Australia, New Zealand, Canada, western Europe, and Japan, should receive at least one dose of hepatitis A vaccine as soon as travel is considered.
- Older adults, persons who are immunocompromised, and persons who have chronic liver disease or other chronic conditions, should receive immunoglobulin and hepatitis A vaccine.



- Immunoglobulin can provide protection at usual doses for three months to travelers younger than 12 months, persons not wishing to receive the vaccine, or persons who are allergic to the vaccine.
- Hepatitis A vaccine should be routinely offered to patients at high risk for infection.
- High-risk populations should be screened for HBV infection.
- Health care professionals should receive hepatitis B vaccination.
- Hepatitis B vaccination and hepatitis B immune globulin are effective at preventing HBV infection in newborns of mothers infected with HBV.
- All persons who meet criteria for chronic HBV infection should be evaluated for treatment.
- Persons with chronic HBV infection who are not immune to hepatitis A should receive two doses of hepatitis A vaccine at least six months apart.
- Patients in the active phase of chronic HBV infection should receive treatment.
- Patients in the inactive or immune tolerant phases of chronic HBV infection should be monitored on a regular basis (every six to 12 months) for reactivation of their infection.
- Persons who are not at increased risk (general population) should not be screened for HCV infection.
- Persons with HCV infection should be vaccinated for hepatitis A and B.
- Persons with chronic HCV infection should abstain from alcohol consumption.
- Hepatotoxic drugs should be avoided in persons with chronic HCV infection and cirrhosis.
- Surveillance for hepatocellular carcinoma should be considered in persons with chronic HCV infection and cirrhosis.
- The standard therapy for chronic HCV infection is pegylated interferon and ribavirin.

A recent review of the literature identifies the following practice changing updates:

- New (June 2015) CDC guidelines on the management of sexually transmitted infections, include screening recommendations that include annual HCV testing for HIV-infected men who have sex with men and *T. vaginalis* testing for HIV-infected women annually and when pregnant.⁴⁵
- Although interferon-based regimens have been the mainstay of treatment for HCV infection, the U.S. Food and Drug Administration recently approved two combination-pill interferon-free treatments (ledipasvir plus sofosbuvir, and ombitasvir/paritaprevir/ritonavir plus dasabuvir) for chronic HCV genotype 1.⁴⁴

These recommendations are provided only as assistance for physicians making clinical decisions regarding the care of their patients. As such, they cannot substitute for the individual judgment brought to each clinical situation by the patient's family physician. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication, but they should be used with the clear understanding that continued research may result in new knowledge and recommendations. These recommendations are only one element in the complex process of improving the health of America. To be effective, the recommendations must be implemented. As such, physicians require continuing medical education to assist them with making decisions about specific clinical considerations.



Physicians should also be kept up to date on new treatment therapies, changes to therapies, or warnings associated with existing therapies. Provide recommendations regarding new FDA approved medications for the treatment of hepatitis; including safety, efficacy, tolerance, and cost considerations relative to currently available options. Current examples include, but are not limited to:⁴⁶⁻⁵¹

- Viekira Pak (ombitasvir, paritaprevir and ritonavir tablets co-packaged with dasabuvir tablets) to treat patients with chronic hepatitis C virus (HCV) genotype 1 infection, including those with a type of advanced liver disease called cirrhosis. (Dec 2014)
- Technivie (ombitasvir, paritaprevir and ritonavir) for use in combination with ribavirin for the treatment of hepatitis C virus (HCV) genotype 4 infections in patients without scarring and poor liver function (cirrhosis). (July 2015)
- Daklinza (daclatasvir) for use with sofosbuvir to treat hepatitis C virus (HCV) genotype 3 infections. Daklinza is the first drug that has demonstrated safety and efficacy to treat genotype 3 HCV infections without the need for co-administration of interferon or ribavirin, two FDA-approved drugs also used to treat HCV infection. (July 2015)
 - Note: On February 5, 2016, FDA approved changes to the DAKLINZA (daclatasvir) label to expand the indication to include HCV genotype 1 infection and expand dosage recommendations to the following populations and to revise dosage recommendations for HCV genotype 3 subjects with compensated (Child-Pugh A) cirrhosis.
 - Additionally, drug-drug interaction data regarding DAKLINZA coadministration with buprenorphine/naloxone, darunavir/ritonavir, dolutegravir, or lopinavir/ritonavir were included in the label.
- Zepatier (elbasvir and grazoprevir) with or without ribavirin for the treatment of chronic hepatitis C virus (HCV) genotypes 1 and 4 infections in adult patients. (Jan 2016)

The American Academy of Family Physicians Academy has participated in the Core Measures Collaborative (the Collaborative) convened by America's Health Insurance Plans (AHIP) since August 2014. The Collaborative is a multi-stakeholder effort working to define core measure sets of various specialties promoting alignment and harmonization of measure use and collection across both public and private payers.

Participants in the Collaborative included Centers for Medicare and Medicaid Services (CMS), the National Quality Forum (NQF), private payers, provider organizations, employers, and patient and consumer groups. This effort exists to decrease physician burden by reducing variability in measure selection, specifications and implementation—making quality measurement more useful and meaningful for consumers, employers, as well as public and private clinicians.

With significant AAFP input, a PCMH/ACO/Primary Care Core Measure Set has been developed for primary care. The goal of this set is to decrease burden and allow for more congruence between payer reporting programs.⁵²

Resources: Evidence-Based Practice Recommendations/Guidelines/Performance Measures

- AAFP Clinical Preventive Services Recommendations²⁶



- Hepatitis A⁴²
- Hepatitis B: diagnosis and treatment¹⁴
- Hepatitis C: diagnosis and treatment⁴³
- AAFP Immunization Schedules²⁷
- CDC Sexually transmitted diseases treatment guidelines⁴⁵
- Vaccine administration: making the process more efficient in your practice²⁸
- CPT Update for 2013²⁹
- Updated CDC recommendations for the management of hepatitis B virus-infected health-care providers and students⁵³
- Special populations. In: Sexually transmitted diseases treatment guidelines⁵⁴
- National Institutes of Health Consensus Development Conference statement: management of hepatitis B⁵⁵
- Viral hepatitis in pregnancy⁵⁶
- Encouraging patients to change unhealthy behaviors with motivational interviewing⁵⁷
- Resolving patients' vaccination uncertainty: going from "no thanks!" to "of course!"⁶
- Immunizations: how to protect patients and the bottom line²³
- CDC Vaccines for Children (VFC) program²⁴
- FamilyDoctor.org. Hepatitis A | Overview (patient education)⁵⁸
- FamilyDoctor.org. Hepatitis B | Overview (patient resource)⁵⁹
- FamilyDoctor.org. Hepatitis C | Overview (patient education)⁶⁰
- CDC Vaccines & Immunizations: Patient Education⁶¹
- FamilyDoctor.org. Immunization Schedules (patient resource)⁶²
- FamilyDoctor.org. Vaccines (many patient resource)⁶³

References

1. Centers for Disease Control and Prevention. Surveillance for Viral Hepatitis – United States, 2011. 2011; <http://www.cdc.gov/hepatitis/Statistics/2011Surveillance/Commentary.htm#hepA>. Accessed August, 2014.
2. Centers for Disease Control and Prevention. Hepatitis B Information for Health Professionals. 2012; <http://www.cdc.gov/hepatitis/HBV/index.htm>. Accessed June, 2013.
3. Hepatitis B Foundation. Hepatitis B. 2013; <http://www.hepb.org/index.html>. Accessed June, 2013.
4. Khabbaz RF, Moseley RR, Steiner RJ, Levitt AM, Bell BP. Challenges of infectious diseases in the USA. *Lancet*. Jul 5 2014;384(9937):53-63.
5. Smith D, Inskip-Paulk E. Adolescent infectious disease challenges. *Adolescent medicine (Philadelphia, Pa.)*. Jun 2000;11(2):211-224.
6. Brown MT, Mena Lora A, Anderson MC, Sinsky CA. Resolving patients' vaccination uncertainty: going from "no thanks!" to "of course!". *Family practice management*. Mar-Apr 2014;21(2):22-26.
7. Krishnarajah G, Carroll C, Priest J, Arondekar B, Burstin S, Levin M. Burden of vaccine-preventable disease in adult Medicaid and commercially insured populations: Analysis of claims-based databases, 2006-2010. *Human vaccines & immunotherapeutics*. Jun 17 2014;10(8).



8. Centers for Disease Control and Prevention. Noninfluenza Vaccination Coverage Among Adults — United States, 2012. *Morbidity and Mortality Weekly Report (MMWR)*. 2014;63(05):95-102. <http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6305a4.htm>. Accessed June 2014.
9. AAFP. 2012 CME Needs Assessment: Clinical Topics. American Academy of Family Physicians; 2012.
10. American Academy of Family Physicians (AAFP). AAFP FMX CME Outcomes Report. Leawood KS: AAFP; 2015.
11. American Academy of Family Physicians (AAFP). 2011 AAFP Scientific Assembly: CME Outcomes Report. Leawood KS: AAFP; 2011.
12. American Academy of Family Physicians (AAFP). 2012 AAFP Scientific Assembly: CME Outcomes Report. Leawood KS: AAFP; 2012.
13. American Academy of Family Physicians (AAFP). AAFP Assembly CME Outcomes Report. Leawood KS: AAFP; 2014.
14. Wilkins T, Zimmerman D, Schade RR. Hepatitis B: diagnosis and treatment. *American family physician*. Apr 15 2010;81(8):965-972.
15. Ghany MG, Doo EC. Antiviral resistance and hepatitis B therapy. *Hepatology*. May 2009;49(5 Suppl):S174-184.
16. Gish RG. Hepatitis B treatment: Current best practices, avoiding resistance. *Cleveland Clinic journal of medicine*. May 2009;76 Suppl 3:S14-19.
17. Zimmerman RK, Silverman M, Janosky JE, et al. A comprehensive investigation of barriers to adult immunization: a methods paper. *The Journal of family practice*. Aug 2001;50(8):703.
18. Zimmerman RK, Nowalk MP, Tabbarah M, Hart JA, Fox DE, Raymond M. Understanding adult vaccination in urban, lower-socioeconomic settings: influence of physician and prevention systems. *Annals of family medicine*. Nov-Dec 2009;7(6):534-541.
19. Zimmerman RK, Santibanez TA, Fine MJ, et al. Barriers and facilitators of pneumococcal vaccination among the elderly. *Vaccine*. Mar 28 2003;21(13-14):1510-1517.
20. Santibanez TA, Nowalk MP, Zimmerman RK, et al. Knowledge and beliefs about influenza, pneumococcal disease, and immunizations among older people. *J Am Geriatr Soc*. Oct 2002;50(10):1711-1716.
21. Santibanez TA, Zimmerman RK, Nowalk MP, Jewell IK, Bardella IJ. Physician attitudes and beliefs associated with patient pneumococcal polysaccharide vaccination status. *Annals of family medicine*. Jan-Feb 2004;2(1):41-48.
22. Campos-Outcalt D, Jeffcott-Pera M, Carter-Smith P, Schoof BK, Young HF. Vaccines provided by family physicians. *Annals of family medicine*. Nov-Dec 2010;8(6):507-510.
23. Loehr J. Immunizations: how to protect patients and the bottom line. *Family practice management*. Mar-Apr 2015;22(2):24-29.
24. Centers for Disease Control and Prevention. Vaccines for Children Program (VFC). 2015; <http://www.cdc.gov/vaccines/programs/vfc/index.html>. Accessed July, 2015.
25. Centers for Disease Control and Prevention (CDC). National Ambulatory Medical Care Survey. In: Ambulatory and Hospital Care Statistics Branch, ed2010.



26. American Academy of Family Physicians (AAFP). Clinical Preventive Services Recommendations. 2012; <http://www.aafp.org/online/en/home/clinical/exam.html>. Accessed May, 2013.
27. American Academy of Family Physicians (AAFP). 2015 AAFP Immunization Schedules. 2015; <http://www.aafp.org/patient-care/immunizations/schedules.html>. Accessed Feb, 2015.
28. Hainer BL. Vaccine administration: making the process more efficient in your practice. *Family practice management*. Mar 2007;14(3):48-53.
29. Seyfried D. CPT Update for 2013. *Family practice management*. Nov-Dec 2012;19(11):8.
30. Oketani M, Ido A, Uto H, Tsubouchi H. Prevention of hepatitis B virus reactivation in patients receiving immunosuppressive therapy or chemotherapy. *Hepatology research : the official journal of the Japan Society of Hepatology*. Jul 2012;42(7):627-636.
31. Moses J, Alkhouri N, Shannon A, et al. Hepatitis B immunity and response to booster vaccination in children with inflammatory bowel disease treated with infliximab. *The American journal of gastroenterology*. Jan 2012;107(1):133-138.
32. Lopez-Serrano P, Perez-Calle JL, Sanchez-Tembleque MD. Hepatitis B and inflammatory bowel disease: role of antiviral prophylaxis. *World journal of gastroenterology : WJG*. Mar 7 2013;19(9):1342-1348.
33. Kawsar HI, Shahnewaz J, Gopalakrishna KV, Spiro TP, Daw HA. Hepatitis B reactivation in cancer patients: role of prechemotherapy screening and antiviral prophylaxis. *Clinical advances in hematology & oncology : H&O*. Jun 2012;10(6):370-378.
34. Heining U, Vaudaux B, Nidecker M, et al. Evaluation of the compliance with recommended procedures in newborns exposed to HBsAg-positive mothers: a multicenter collaborative study. *The Pediatric infectious disease journal*. Mar 2010;29(3):248-250.
35. Easterbrook P, Sands A, Harmanci H. Challenges and priorities in the management of HIV/HBV and HIV/HCV coinfection in resource-limited settings. *Seminars in liver disease*. May 2012;32(2):147-157.
36. Foster T, Hon H, Kanwal F, Han S, Spiegel B. Screening High Risk Individuals for Hepatitis B: Physician Knowledge, Attitudes, and Beliefs. *Digestive diseases and sciences*. Oct 15 2011.
37. Cohen C, Holmberg SD, McMahon BJ, et al. Is chronic hepatitis B being undertreated in the United States? *Journal of viral hepatitis*. Jun 2011;18(6):377-383.
38. Abramson A, Menter A, Perrillo R. Psoriasis, hepatitis B, and the tumor necrosis factor-alpha inhibitory agents: a review and recommendations for management. *Journal of the American Academy of Dermatology*. Dec 2012;67(6):1349-1361.
39. McCarthy EM, Azeez MA, Fitzpatrick FM, Donnelly S. Knowledge, attitudes, and clinical practice of rheumatologists in vaccination of the at-risk rheumatology patient population. *Journal of clinical rheumatology : practical reports on rheumatic & musculoskeletal diseases*. Aug 2012;18(5):237-241.
40. Ioannou GN. Hepatitis B virus in the United States: infection, exposure, and immunity rates in a nationally representative survey. *Annals of internal medicine*. Mar 1 2011;154(5):319-328.



41. American Academy of Family Physicians (AAFP). Hepatitis. *Clinical Preventive Service Recommendation* 2014; <http://www.aafp.org/patient-care/clinical-recommendations/all/hepatitis.html>. Accessed July, 2015.
42. Matheny SC, Kingery JE. Hepatitis A. *American family physician*. Dec 1 2012;86(11):1027-1034; quiz 1010-1022.
43. Wilkins T, Malcolm JK, Raina D, Schade RR. Hepatitis C: diagnosis and treatment. *American family physician*. Jun 1 2010;81(11):1351-1357.
44. Wilkins T, Akhtar M, Gititu E, Jalluri C, Ramirez J. Diagnosis and Management of Hepatitis C. *American family physician*. Jun 15 2015;91(12):835-842.
45. Workowski KA, Bolan GA. Sexually transmitted diseases treatment guidelines, 2015. *MMWR. Recommendations and reports : Morbidity and mortality weekly report. Recommendations and reports / Centers for Disease Control*. Jun 5 2015;64(RR-03):1-137.
46. U.S. Food and Drug Administration. FDA Hepatitis Update - Changes to the Daklinza (daclatasvir) label expand indication. *FDA Bulletin* 2016; <http://content.govdelivery.com/accounts/USFDA/bulletins/134cc5e>. Accessed June, 2016.
47. CenterWatch. FDA Approved Drugs by Medical Condition. 2016; <https://www.centerwatch.com/drug-information/fda-approved-drugs/medical-conditions/>. Accessed Apr, 2016.
48. U.S. Food and Drug Administration. FDA approves Zepatier for treatment of chronic hepatitis C genotypes 1 and 4. *FDA NEW RELEASE* 2016; <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm483828.htm>. Accessed June, 2016.
49. U.S. Food and Drug Administration. FDA approves new treatment for chronic hepatitis C genotype 3 infections. *FDA NEWS RELEASE* 2015; <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm455888.htm>. Accessed June, 2016.
50. U.S. Food and Drug Administration. FDA approves Technivie for treatment of chronic hepatitis C genotype 4. *FDA NEWS RELEASE* 2015; <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm455857.htm>. Accessed June, 2016.
51. U.S. Food and Drug Administration. FDA approves Viekira Pak to treat hepatitis C. 2014; <http://www.fda.gov/NewsEvents/Newsroom/PressAnnouncements/ucm427530.htm>. Accessed June, 2016.
52. American Academy of Family Physicians (AAFP). PCMH/ACO/Primary Care Core Measure Set. 2016; <http://www.aafp.org/practice-management/improvement/measure.html>. Accessed May, 2016.
53. Centers for Disease C, Prevention. Updated CDC recommendations for the management of hepatitis B virus-infected health-care providers and students. *MMWR. Recommendations and reports : Morbidity and mortality weekly report. Recommendations and reports / Centers for Disease Control*. Jul 6 2012;61(RR-3):1-12.
54. Centers for Disease Control and Prevention (CDC). Special populations. In: Sexually transmitted diseases treatment guidelines, 2010. 2010;



- <http://www.guideline.gov/content.aspx?id=25578&search=hepatitis+b>. Accessed 6/18/2013.
55. Sorrell MF, Belongia EA, Costa J, et al. National Institutes of Health Consensus Development Conference statement: management of hepatitis B. 2009; <http://www.guideline.gov/content.aspx?id=14240&search=hepatitis+b>. Accessed 6/18/2013.
 56. American College of Obstetricians and Gynecologists (ACOG). Viral hepatitis in pregnancy. 2012; <http://www.guideline.gov/content.aspx?id=12627&search=hepatitis+b>. Accessed 6/18/2013.
 57. Stewart EE, Fox CH. Encouraging patients to change unhealthy behaviors with motivational interviewing. *Family practice management*. May-Jun 2011;18(3):21-25.
 58. FamilyDoctor.org. Hepatitis A | Overview. 2006; <http://familydoctor.org/familydoctor/en/diseases-conditions/hepatitis-a.html>. Accessed August, 2014.
 59. FamilyDoctor.org. Hepatitis B | Overview. 1996; <http://familydoctor.org/familydoctor/en/diseases-conditions/hepatitis-b.html>. Accessed August, 2013.
 60. FamilyDoctor.org. Hepatitis C | Overview. 2000; <http://familydoctor.org/familydoctor/en/diseases-conditions/hepatitis-c.html>. Accessed August, 2014.
 61. Centers for Disease Control and Prevention. Vaccines & Immunizations: Patient Education. 2013; <http://www.cdc.gov/vaccines/ed/patient-ed.htm>. Accessed August, 2013.
 62. FamilyDoctor.org. Immunization Schedules. 2013; <http://familydoctor.org/familydoctor/en/health-tools/immunization-schedules.html>. Accessed August, 2013.
 63. FamilyDoctor.org. Vaccines. 2013; <http://familydoctor.org/familydoctor/en/kids/vaccines.html>. Accessed August, 2013.