Common Childhood Viral Infections

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Infections caused by viruses are universal during childhood and adolescence. Clinicians will regularly care for children and adolescents who present with infections caused by a wide number of viral pathogens. These infections have varied presentations. Many infections may have clinical presentations that are specific to the infecting virus but present differently, based on the age and immunocompetence of the patient. Some children are directly impacted early in their lives when maternal disease results in an in utero infection (cytomegalovirus, rubella virus, or parvovirus B19). Other viruses may infect children in a predictable pattern as they grow older (rhinovirus or influenza virus). Fortunately, many viral infections frequently encountered in the past are no longer extant due to widespread immunization efforts. Recognition of these vaccine-preventable infections is important because outbreaks of some of these diseases (mumps or measles) continue to occur in the United States. Vigilance in vaccine programs against these viral agents can prevent their re-emergence. In addition, an increasing number of viral infections (herpes simplex virus, influenza virus, varicella zoster virus, or cytomegalovirus) can now be successfully treated with antiviral medications. Most viral infections in children result in self-limited illness and are treated symptomatically and infected children experience full recovery. This review will address the epidemiology, clinical presentation, diagnosis, treatment, and prevention of viral infections commonly encountered by the clinician.

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Infectious diseases are often encountered in the care children and adolescents. Infections caused by viral pathogens account for the majority of these recognized infectious diseases. The clinical picture may range from asymptomatic viral infection (confirmed only through diagnostic testing) to life-threatening presentations. Recognition of the varied clinical presentations of childhood infectious diseases is critical to guide appropriate management of the patient. This review will address infections that are commonly encountered by the primary care clinician. Many of these infections may be prevented through immunization of susceptible persons.[1] A small number of viral infections can be treated with antiviral chemotherapy. However, the majority of infections caused by viruses are solely managed symptomatically. Many of these infectious diseases can present with cutaneous and/or mucosal physical findings. To assist in the clinical recognition of some of these infections, the clinician is referred to the excellent collection of clinical images available through the American Academy of Pediatrics' Red Book Online collection.[2] This review discusses childhood viral illnesses that are often seen in primary care settings. This review does not discuss severe infections among immunocompromised individuals or infections caused by human immunodeficiency virus (HIV).

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Vaccine-Preventable Viral Infections

Many childhood viral infections are prevented through vaccination (Table 1). Both the current recommended immunization schedules for persons ranging from birth through 18 years of age and the catch-up immunization schedule are available on the Center for Disease Control and Prevention's (CDC) website at http://www.cdc.gov/vaccines/schedules/hcp/child-adolescent.html.

Measles (Rubeola)

Measles is caused by the rubeola virus, a single-stranded RNA virus from the family of paramyxoviruses. Before the availability of vaccines in 1963 in the

TABLE 1. Viral vaccines: Impact on vaccine-preventable disease

Vaccine	Year developed/ vaccine type[a]	Pre-vaccine[b] era annual estimate	2010 Estimate	Percentage decrease	Comments[c]
Hepatitis A	1996/Inactivated, whole agent	117,333	7138	94	Pediatric vaccine formulations approved for persons 12 months through 18 years. Adult formulations approved for persons 19 years and older. Two-dose schedule: >95% seropositive after one dose with 100% seropositive after two doses.
Hepatitis B (acute)	1981/Inactivated subunit	66,232	9428	86	80–100% effective in preventing infection or clinical hepatitis in those who receive the complete course of vaccine. Recommended dosage of vaccine varies, depending on the age of the recipient and the type of vaccine. First dose for all infants soon after birth and before hospital discharge. Administer both birth dose and hepatitis B immune globulin (HBIG) if mother is hepatitis B surface antigen (HBsAg) positive. Preterm infants <2000 g have a decreased response to vaccine administered before 1 month of age. Delay first dose until chronologic age of 1 month if mother is HBsAg negative.
Rotavirus (hospitalizations, <3 years of age)	2006/Live attenuated	62,500	2500	96	Two licensed live rotavirus vaccines: pentavalent (3-dose schedule) and monovalent (2-dose schedule). For both: maximum age of first dose of 14 weeks 6 days, maximum age for any dose of 8 months 0 days. Contraindication: history of intussusception, severe combined immunodeficiency syndrome.
Varicella	1995/Live attenuated 2006 (Zoster)/live attenuated	4,085,120	281,873	95	Rare mild, breakthrough disease in persons fully vaccinated after chickenpox exposure. Effective as a postexposure prophylaxis. Available as combination vaccine with measles–mumps–rubella (MMRV). Precaution with MMRV only if personal or family (sibling or parent) history of seizures.
		20th century annual morbidity[b]	**2011 reported cases**		
Measles	1963/Live attenuated	530,217	212	>99	Two-dose vaccine series protects persons who failed to respond to the first dose. Safe to administer in egg-allergic children. Vaccine may prevent disease in measles-susceptible persons if given within 72 h of exposure. Available as combination vaccine with measles–mumps–rubella (MMR) or combined with varicella as MMRV. Precaution with MMRV only if personal or family (sibling or parent) history of seizures. Unless there is parental preference for MMRV, CDC recommends separate MMR and varicella vaccines for the first dose.
Mumps	1967/Live attenuated	162,344	370	>99	Available as a combination vaccine with measles–mumps–rubella (MMR) or combined with varicella as MMRV. As with measles and rubella vaccines, mumps vaccine (as MMR) is contraindicated in those with severe immunodeficiency. Precaution with MMRV only if there is personal or family (sibling or parent) history of seizures.