



ROBERT J.  
SOMMER, M.D.

## SUBSPECIALIST CONSULT

# Evaluation of the Child With Syncope

Fainting in children most often is benign. Often from a history alone, you can determine critical information that

will enable you to reassure the patient and family or to consider referral for a specialist evaluation.

The most important thing to determine is the course of events that preceded the syncopal event. That is, if the child just completed a sporting activity on a hot day, was in a hot shower, had a high fever, or was dehydrated before fainting, the level of anxiety about the event should be very low. The same applies if the syncope was triggered by a sudden fright or other strong emotional event.

If the child is old enough to provide a good description of the event, ask if they “knew” that something was about to happen before they fainted. Most patients with routine syncope report an “aura”

**The most important thing to determine is the course of events that preceded the syncopal event. Most patients with routine syncope report an ‘aura.’**

that includes visual changes (tunnel vision or vision getting dark, for example) and dizziness. Also, witnesses will say that the child “woke up” quickly and without prolonged confusion after the event. Such a description helps to distinguish a simple syncopal event from a seizure or a life-threatening arrhythmia.

With most benign cases of syncope, the pediatrician should counsel the child and the parents about adequate hydration before participation in sports and to be mindful of getting enough salt in the diet.

A normal history and physical examination should reassure you. In most cases, these normal findings will mean that you can treat the child in your office without further referrals.

Don’t forget to take the child’s blood pressure. Low resting blood pressure, especially in rapidly growing teenagers, can predispose your patients to vasovagal syncope. Patients with low resting blood pressure often have a lower threshold for syncope, compared with children with normal pressure. Recommend addition of some salt to the patient’s diet if he has low blood pressure – this can help to reduce the risk of future syncope.

Injury prevention is important, because children who experience syncope often fall unexpectedly. The best strategy to minimize this risk is to review the symptoms that herald the onset of syncope with each patient. Then instruct the child if she experiences any of the warning signs to get to the floor with her legs

elevated as soon as possible. This also will reduce the severity and the length of the episode.

Patients and parents will naturally have questions after the child experiences syncope. Although noncardiac conditions such as hypothyroidism or epilepsy can cause a child to faint, fainting is usually a failure of the heart to pump enough blood to the brain. Syncope can result

from low blood pressure (dehydration, vasodilation), poor pumping function of the heart, other structural heart issues, and/or from a change in the rhythm that leads to less-efficient pumping. Rhythm changes include both fast and slow heart rates.

In the absence of any structural or electrical abnormality of the heart, the most common reason for fainting is vaso-

vagal syncope. There are two sets of nerves that connect the central nervous system to the heart. The sympathetic system sends the “speed up” signal to the heart and the vagus nerve sends the “slow-down” signal to the heart. Vaso-vagal syncope occurs when the body sends an erroneous signal to the heart to slow down, insufficient blood is pumped, blood pressure falls, and the child faints.

Because you care,  
this little piggy could change the world

Give the proven protection of Pentacel,  
the only DTaP-IPV/Hib<sup>a</sup> vaccine—because  
caring is at the heart of all you do.<sup>1-4</sup>

During a syncopal work-up, most important structural heart issues, which can cause fainting, will be obvious on a physical examination. In almost all cases, children with cardiac disease significant enough to cause syncope will have been diagnosed previously. The exam can feature significant cardiac murmurs, peripheral edema, chest pain, jugular venous distention, hepatomegaly, and absent or diminished pulses. Patients with significant congenital heart disease most often will present with shortness of breath on exertion. If you rule out these findings and the patient has a normal

examination, you can be virtually certain that the event is not related to a structural heart problem.

If there is any doubt, an echocardiogram is the definitive test to rule out a subtle structural abnormality. Hypertrophic cardiomyopathies and coronary anomalies are among the conditions that may contribute to syncope and may only be detectable with specialized cardiac imaging.

The child with recurrent syncopal events or with an atypical history most often requires additional evaluation by a specialist, usually to reassure the family.

When I see a patient for the first time, I take a thorough history and order an ECG to detect the most common electrical/arrhythmic reasons for syncope. A diagnosis of Wolff-Parkinson-White syndrome, heart block, and long QT syndrome can easily be identified from a routine ECG. Holter evaluations or 30-day home monitoring may be helpful in ruling out arrhythmias. Neurologic evaluation can be helpful to rule out seizure activity which may masquerade as syncope. Rarely, in teenagers and adults, atypical migraine headaches may present with alterations of conscious-

ness. In these patients, there is often a strong family history of migraine. When these episodes recur, they are similar each time, as is stereotypical of other migraine aura. ■

DR. SOMMER is director of the invasive adult congenital disease and invasive structural interventions programs at the Center for Interventional Vascular Therapy at Columbia University Medical Center in New York. He specializes in treatment of adult and pediatric congenital heart disease. Dr. Sommer said that he had no relevant financial disclosures.

**E**very day you demonstrate your promise to protect tiny tots who have huge potential. For you, there's Pentacel vaccine. As a 4-dose DTaP-IPV/Hib<sup>a</sup> combination vaccine, it saves shots and naturally fits the pediatric schedule.<sup>5,6,b</sup>

That's important, because by 24 months of age, 1 in 5 children have not received their fourth dose of DTaP vaccine.<sup>7</sup> This leaves them 6 months behind the recommended immunization schedule and vulnerable to potentially devastating diseases.<sup>6</sup> According to the AAP<sup>c</sup>, administering a combination vaccine like Pentacel vaccine may enhance timeliness and compliance.<sup>8</sup> Pentacel vaccine and you—helping protect the future.



**Pentacel®**

**Diphtheria and Tetanus Toxoids and Acellular Pertussis Adsorbed, Inactivated Poliovirus and Haemophilus b Conjugate (Tetanus Toxoid Conjugate) Vaccine**

**Protection to grow on**

Learn more about how you can help enhance DTaP compliance. Visit [pentacel.com/piggy](http://pentacel.com/piggy).

## Indication

Pentacel vaccine is indicated for active immunization against diphtheria, tetanus, pertussis, poliomyelitis, and invasive disease due to *Haemophilus influenzae* type b. Pentacel vaccine is approved for use as a 4-dose series in children 6 weeks through 4 years of age (prior to fifth birthday).

## Safety Information

The most common local and systemic adverse reactions to Pentacel vaccine include injection site redness, swelling, and tenderness; fever, fussiness, and crying. Other adverse reactions may occur. Known systemic hypersensitivity reaction to any component of Pentacel vaccine or a life-threatening reaction after previous administration of the vaccine or a vaccine containing the same substances are contraindications to vaccination.

The decision to give Pentacel vaccine should be based on the potential benefits and risks; if Guillain-Barré syndrome has occurred within 6 weeks of receipt of a prior vaccine containing tetanus toxoid; or if adverse events have occurred in temporal relation to receipt of pertussis-containing vaccine. Encephalopathy within 7 days of administration of a previous dose of a pertussis-containing vaccine or a progressive neurologic disorder is a contraindication. Vaccination with Pentacel vaccine may not protect all individuals.

Before administering Pentacel vaccine, please see brief summary of full Prescribing Information.

To order Pentacel vaccine, log onto **VaccineShopper.com®** or call **1-800-VACCINE** (1-800-822-2463).

**CPT<sup>®</sup> Code: 90698**

<sup>a</sup> DTaP = Diphtheria, tetanus, and acellular pertussis; IPV = Inactivated poliovirus; Hib = *Haemophilus influenzae* type b. <sup>b</sup> Children should receive a fifth dose of DTaP at 4-6 years of age. <sup>1</sup> <sup>c</sup> AAP = American Academy of Pediatrics. <sup>d</sup> CPT = Current Procedural Terminology is a registered trademark of the American Medical Association.

Pentacel vaccine is manufactured by Sanofi Pasteur Limited and Sanofi Pasteur SA and distributed by Sanofi Pasteur Inc.

**References:** 1. Pentacel vaccine [Prescribing Information]. Swiftwater, PA: Sanofi Pasteur Inc.; 2009. 2. Decker MD, Edwards KM, Bradley R, Palmer P. Comparative trial in infants of four conjugate *Haemophilus influenzae* type b vaccines. *J Pediatr*. 1992;120:184-189. 3. Granoff DM, Anderson EL, Osterholm MT, et al. Differences in the immunogenicity of three *Haemophilus influenzae* type b conjugate vaccines in infants. *J Pediatr*. 1992;121:187-194. 4. Greenberg DP, Lieberman JM, Marcy SM, et al. Enhanced antibody responses in infants given different sequences of heterogeneous *Haemophilus influenzae* type b conjugate vaccines. *J Pediatr*. 1995;126:206-211. 5. US Food and Drug Administration. Pentacel®: DTaP-IPV/Hib combined (diphtheria and tetanus toxoids and acellular pertussis adsorbed, inactivated poliovirus and *Haemophilus b* conjugate [tetanus toxoid conjugate] vaccine combined). VRBPAC Briefing Document. <http://www.fda.gov/ohrms/dockets/ac/07/briefing/2007-4275B1-01.pdf>. Accessed April 18, 2011. 6. Centers for Disease Control and Prevention (CDC). Recommended immunization schedules for persons aged 0 through 18 years—United States, 2011. *MMWR*. 2011;60(5):1-4. 7. CDC. Estimated vaccination coverage with individual vaccines and selected vaccination series before 24 months of age by state and local area US, National Immunization Survey, Q1/2009-Q4/2009. [http://www2a.cdc.gov/nip/coverage/nis/nis\\_iap2.asp?fmt=v&rpt=tab09\\_24mo\\_iap&qtr=Q1/2009-Q4/2009](http://www2a.cdc.gov/nip/coverage/nis/nis_iap2.asp?fmt=v&rpt=tab09_24mo_iap&qtr=Q1/2009-Q4/2009). Accessed April 18, 2011. 8. American Academy of Pediatrics. Combination vaccines for childhood immunization: recommendations of the Advisory Committee on Immunization Practices (ACIP), the American Academy of Pediatrics (AAP), and the American Academy of Family Physicians (AAFP). *Pediatrics*. 1999;103:1064-1077.