Problem: Symptomatic arrhythmias in children with an otherwise normal heart are among the most commonly treated pediatric cardiac rhythm abnormalities, with supraventricular tachycardia (SVT) being the most prevalent. Previously, children with SVT who have an otherwise normal heart were treated with medications to control the heart rhythm or by restricting exercise, both of which affect the patient’s perceived quality of life. Cardiac ablation was used only after medical management had failed. However, with advancements in technical equipment, ablation is often offered as the curative option at the time of initial diagnosis for all patients with SVT. Ablation is typically the only curative treatment to eliminate the need for medications, allowing children to resume normal activities without restriction. (Strieper, 2012)

SVT in children: A closer look at management

Supraventricular tachycardia originating from a secondary electrical pathway between the atria and ventricle, or from the AV node, often generates heart rates exceeding 220 beats per minute in children and teenagers. Although relatively benign in nature, symptoms of SVT can cause significant fear in the child as well as for family members. Symptoms during an episode can include palpitations, dizziness, fatigue, pallor and shortness of breath, which create a significant amount of anxiety, sending both the child and his or her caregivers in search of a cure. Any child with a healthy heart who is unable to continue normal childhood play and activity as a result of SVT should be evaluated for treatment by a pediatric cardiologist or electrophysiologist.
Management options of SVT in the otherwise normal heart may take three forms:

- **Watchful waiting.** In mild cases where children report only occasional symptoms, there may be no need for medical management; doctors may teach vagal maneuvers to terminate the tachyarrhythmia when it occurs.

- **Pharmacologic management.** Traditional use of beta blockers may be implemented, particularly for infants and toddlers who are unable to verbalize an episode, but is not always required as a first-line option for older children.

- **Catheter ablation.** Cardiac ablation may be offered at the time of diagnosis as a curative option. Exercise restrictions are often placed on children with SVT but aren’t usually required. Symptoms of SVT that are triggered by exertion may limit some activities, but most children are able to continue normal physical activity even with a diagnosis of SVT.

**Advantages of catheter ablation for SVT**

- High success rate (approximately 90 percent to 95 percent or better in children with normal hearts).

- Outpatient procedure with short recovery time.

- Often first line of treatment for children with other comorbidities, such as ADHD or asthma.

- Requires a specialist with training in pediatric electrophysiology.

- Curative option for SVT.

- After successful ablation, medications are no longer necessary.

**SVT patients who can benefit the most from cardiac ablation**

- Children with SVT and comorbidities of asthma or ADHD are likely to benefit significantly from the curative option of ablation.

- Many athletes or highly active adolescents who experience SVT will be candidates for ablation and welcome the opportunity to continue sports without further symptoms.
Referral process for both local and telemedicine patients

Access
- Physicians who desire consultation may contact the Department of Pediatric Cardiology directly. A pediatric cardiologist is available 24/7 for consultation, EKG interpretation and evaluation, or when a child is admitted to the ED by calling UK•MDs at 1-800-888-5533 or 859-257-5522.
- Pediatric patients with rhythm abnormalities who live far from UK may also access services through the Kentucky Telecare Network via telemedicine technology. Patients can see the specialist, just as if they were in the same room. A pediatric electrophysiologist may be able to evaluate the patient remotely – only requiring a drive to Lexington only for advanced testing or ablation as necessary.
- For questions and to determine if urgent care is needed, physicians in outlying practices are encouraged to send EKG strips to Anna Kamp, MD, by calling UK•MDs at 1-800-888-5533 or 859-257-5522. A pediatric cardiology clinic nurse is also available Monday through Friday and can be reached at 859-323-6754.

Clinical process
- Clinical evaluation can often begin by sending the patient a Holter monitor or event monitor by mail if appropriate. Equipment can be mailed back and analyzed prior to the patient's first face-to-face or telemedicine appointment.
- After the initial consultation, a treatment plan is developed and any necessary testing appointments will be made.
- The patient’s and family’s readiness for ablation is discussed as part of a decision whether to perform cardiac ablation.
- Ablation or other diagnostics will be scheduled once all testing and data collection are completed.
- Patients will usually follow up with Dr. Kamp at six weeks and six months. Telemedicine services may be available for patients who live away from Lexington.
About Anna Kamp, MD, MPH

Anna Kamp, MD, MPH, joined the Kentucky Children’s Hospital Congenital Heart Clinic from the University of Michigan in 2011. Dr. Kamp is among a select group of physicians who specialize in pediatric electrophysiology. Dr. Kamp is one of only two pediatric electrophysiologists in Kentucky and one of only 150 in the United States.

Dr. Kamp, a graduate of Indiana University School of Medicine, completed her postdoctoral training in pediatric cardiology and electrophysiology at the University of Michigan and also holds a Masters in Public Health from Emory University. An accomplished researcher and author, Dr. Kamp has received a variety of grants for medical research and has co-authored several medical abstracts and peer-reviewed journals for the Centers for Disease Control and Prevention, Emory University School of Medicine and the University of Michigan.

Dr. Kamp is certified by the American Board of Internal Medicine and the American Board of Pediatrics, and she welcomes the opportunity to participate in community presentations as well as consultations with outlying physicians. She can be reached by calling UK•MDs at 1-800-333-8874.

To make a referral

To contact a member of our team or to schedule an appointment, call our 24/7 UK•MDs physician-to-physician line at 1-800-888-5533.
Wolff-Parkinson-White Syndrome and SVT

Wolff-Parkinson-White in children: A look at management

Wolff-Parkinson-White (WPW) syndrome is a special form of accessory pathway connection between the atrium and ventricle. The majority of patients with WPW and tachyarrhythmias have SVT; however, a small number of patients with WPW may be at risk for more dangerous arrhythmias. Risk stratification, used in conjunction with electrophysiology studies and ablation as indicated in asymptomatic children with WPW, can help assess and eliminate future risk for cardiac complications. Appropriate management of WPW is best evaluated by a pediatric electrophysiologist. (Balaji, 2009).

Most cases of WPW are found on an EKG obtained for another reason. Children with WPW on an EKG should be evaluated by a pediatric electrophysiologist, even if they are asymptomatic. Risk stratification of the pathway is necessary to determine whether the pathway could be potentially dangerous to the patient. Because WPW can rarely be associated with dangerous arrhythmias, it is important these children be evaluated by a pediatric cardiologist soon after the diagnosis is made. Risk stratification for asymptomatic patients with WPW usually includes a Holter monitor, treadmill exercise test and sometimes invasive electrophysiology testing. (Heart Rhythm Society, 2012)

References


Case Study

A 10-year-old female presented to the Kentucky Children’s Hospital Congenital Heart Clinic with her parents in early 2012 for the evaluation of symptomatic tachycardic episodes that had occurred for two years. The patient and family reported an interruption in her ability to compete in sports as well as social events regardless of activity level. Starting in May 2011, the patient had been treating events with vagal maneuvers and beta blockers prescribed by another cardiologist. Beta blockers were discontinued due to interference with the patient’s ADHD therapy. The patient experienced multiple events that could not be converted with vagal maneuvers. She visited the emergency room, where adenosine was administered to successfully stop the rhythm. Family members reported that events were increasing over time and occurring three or four days a week with multiple episodes each day.

The patient was evaluated by Anna Kamp, MD, including evaluation of a previous echocardiogram and electrocardiogram results. The patient had already obtained a previous diagnosis of SVT. Options for management were discussed. Watchful waiting was not appropriate as the patient was having too many episodes, and beta blockers were interfering with other treatments, leaving ablation as the best option. The patient underwent an electrophysiology study in April and was diagnosed with atrioventricular nodal re-entrant tachycardia (AVNRT) for which she underwent ablation, spent four to six hours in recovery and was discharged home the same day. She returned to school and followed up with Dr. Kamp in May, and will follow up every six months or as needed. She resumed athletics and normal activities without complications and without anti-arrhythmic therapy and has had no recurrence of SVT.