



# Hop, Skip & Jump: Palpitation in childhood



By Dr Luigi D'Orsogna

## About the Author

Dr Luigi D'Orsogna is a graduate of UWA who trained in Paediatrics at the Children's Hospital in Vancouver, Canada, and Princess Margaret Hospital. He completed a fellowship in Paediatric Cardiology at the Children's Hospital in Boston and the Harvard Medical School where he developed a special interest in Fetal Cardiology and interventional cardiac catheterisation procedures for congenital heart disease. Currently, he is the Director of Cardiac Catheterisation Laboratory at Princess Margaret Hospital and is the Fetal Cardiologist in the Maternal Fetal Medicine Unit at King Edward Memorial Hospital for Women. His private practice includes all aspects of general Paediatric Cardiology.

Palpitations in children is a common presentation for arrhythmia. Fortunately, most arrhythmias in children are benign. Most children who complain of palpitations tend to be in the pre-school or school age but even a two or three-year-old may complain of "skipping", "hop" or "jump" as a sensation in their chest. Generally, it is very reassuring to find that in children who complain of palpitations and are otherwise well with normal cardiac findings on examination and ECG, that the underlying arrhythmia is benign. If there is any doubt or if the arrhythmia is particularly bothersome for the child or parents then referral to paediatric cardiologist can help.

Most palpitations in childhood are due to either irregular heart beats or tachyarrhythmias. The causes of irregular heart beat in children are sinus arrhythmia, atrial or ventricular ectopic beats and 2° AV block. Sinus arrhythmia is very common and physiological – these children do not complain of palpitation but the irregular rhythm is detected incidentally during examination and although sometimes very marked, is not significant in an otherwise very healthy child.

**Isolated atrial or ventricular ectopic beats (VEBs) are common in newborns or, indeed, in the fetus.** Blocked atrial ectopic beats may be misinterpreted in the fetus as fetal sinus bradycardia but this can be differentiated by fetal echocardiography. Atrial ectopy in the fetus with normal cardiac structure and function usually resolves spontaneously by birth but, occasionally, atrial ectopic beats continue in the early neonatal period. A newborn with an irregular heart rhythm should have an ECG to assess for atrial or VEBs. If this shows only isolated atrial ectopic beats or monomorphic VEBs, and the newborn is otherwise very well with no other clinical signs of cardiac disease, then the ectopy can be assumed to be benign and will usually resolve spontaneously within the first few months.

**Ventricular ectopy may develop later in childhood** but, again, is usually benign if the VEBs are isolated and monomorphic (uniform) and the child is otherwise clinically well. Infrequently, there may be an obvious cause such as excessive caffeine ingestion, beta agonist medication or ADHD drugs. However, in most children, there are no underlying precipitants but the ectopy will generally resolve spontaneously with time. If the child has frequent monomorphic VEBs, it is reassuring to have them exercise as benign ventricular ectopy tends to disappear as the sinus rate increases. Ventricular ectopy that

worsens with exercise will require further evaluation by a specialist. It goes without saying that any child who has other cardiac symptoms such as exertional intolerance, dizziness or light headedness, or has any other abnormality on clinical examination of the heart should be referred for further evaluation in the presence of ventricular ectopy.

**Tachyarrhythmias in childhood are not rare.** Most children who complain of their heart beating quickly are, in fact, aware of their heart rhythm during sinus tachycardia, which may be physiological in response to exercise, fever, or pain. As the child becomes aware of their praecordial activity, anxiety may become a factor and worsen the palpitation. Usually, this will be obvious from a careful history. It is important to differentiate chest pain and palpitations

suggestive of tachyarrhythmia: chest pain that commences before the onset of the tachyarrhythmia is usually not cardiac in origin (i.e. more commonly musculoskeletal chest pain or exercise-induced bronchospasm), whereas chest pain that develops after the onset of tachyarrhythmia may be due to supraventricular tachycardia (SVT). If the child has persistent sinus tachycardia then other secondary causes should be sought such as anaemia, hyperthyroidism or rare catecholamine secreting tumours.

**Supraventricular tachycardia in childhood is less common** but, generally, is also benign. Most children who complain of palpitations consistent with tachyarrhythmia due to SVT will give a history of the heart rate suddenly increasing and abruptly terminating. The heart rate is excessively rapid, often too difficult for an observer to count and children usually describe the palpitation as "fluttering" or "beeping very quickly". Most SVT in childhood is not associated with underlying heart disease and the resting ECG is normal. However, an ECG is essential in all children who complain of palpitation suggestive of tachyarrhythmia to investigate ventricular pre-excitation (Wolff-Parkinson-White Syndrome) with short PR interval and delta waves, or more rare and sinister cardiac abnormalities such as repolarisation disorders with prolonged QT interval, or left ventricular hypertrophy in an older child with hypertrophic cardiomyopathy. ■



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