

Clinical Guideline

WATCH – MANAGEMENT OF THE CHILD WITH A TACHYARRHYTHMIA

SETTING	Wales and West Acute Transport for Children
FOR STAFF	WATCH Team, South West and Wales District General Hospital medical and nursing teams.
PATIENTS	Children requiring emergent treatment for a tachyarrhythmia

GUIDANCE

This guidance offers advice for the WATCH team and DGH staff treating children with a cardiac arrhythmia. It highlights the likely presentation, early management and treatment options when managing a child with a tachyarrhythmia. A summary guideline is on page 2 and is available on the WATCH website (www.watch.nhs.uk).

RELATED DOCUMENTS	<ol style="list-style-type: none">1. Dubin (2019) Management of Supraventricular Tachycardia in Children2. Kanter (2019) Atrial Tachyarrhythmias in Children3. APLS (2016)
AUTHORISING BODY	WATCH Clinical Guideline Group Cardiology Department - BRHC
SAFETY	Refractory tachyarrhythmia should be discussed with the WATCH team and a tertiary cardiologist
QUERIES	WATCH office – 0300 0300 789

MANAGEMENT OF THE CHILD WITH A TACHYARRHYTHMIA

PRESENTATION		EARLY MANAGEMENT
Infant: Poor feeding, lethargy, irritability, pallor, diaphoresis	Child: Palpitations, dizziness, chest pain, syncope, diaphoresis exercise intolerance, fatigue	Recognition of the child in shock (poor perfusion, hypotension, decreased conscious level) Stabilisation of ABC: <ul style="list-style-type: none"> ➤ O₂ titrated to maintain SpO₂ where expected for the child (caution in balanced circulation) ➤ IV/IO access, bloods for U&E, FBC and a gas ➤ Early intubation and ventilation if shocked/neonate ➤ 12 lead ECG and record rhythm strip during treatment ➤ Active temperature management ➤ Normalise electrolytes (K⁺ >4.0, ion Ca >1.0, Mg >1.0) ➤ Defibrillator pads on prior to treatment ➤ Consultant Anaesthetist / Paediatrician available for intubation – laryngoscopy may cause vagal stimulation ➤ Conference call with WATCH (0300 0300 789)
POSSIBLE CAUSES		
Life-threatening primary arrhythmias are uncommon in children. Exclude primary pathologies: Hypoxia / Sepsis / Ingestion / Cardiac Surgery Atrial or ventricular tachycardia causes include: structural abnormalities, Wolf-Parkinson-White, myocarditis, renal disease, hypokalaemia, hypomagnesaemia, long QT syndrome, hyperthyroidism.		
SUPRAVENTRICULAR TACHYCARDIA (SVT) – associated with Wolf-Parkinson-White Syndrome		
ECG	Patient Stable	Cardiogenic Shock
Abrupt rate changes P waves absent/abnormal Narrow QRS HR not variable Infants: rate usually >220bpm Children: rate usually >180bpm	Vagal manoeuvre: Facial immersion in iced water for 5 seconds (infants) or glove filled with iced water for 20 seconds or Valsalva (older child) Adenosine: Rapid Injection then rapid flush of 0.9% NaCl in a large upper limb vein – starting dose 100micrograms/kg increasing by 100micrograms/kg in 2 min intervals up to 500micrograms/kg (12mg max). If no sustained response to adenosine consider DC Shock / Amiodarone	Adenosine (as previously) while preparing to intubate. If cardioversion not achieved: Intubate and Ventilate Synchronised DC Shock 1-2J/kg Amiodarone: 5mg/kg IV over 30mins
ATRIAL FLUTTER – associated with dilated right atrium, atrial surgery		
ECG	Patient Stable	Cardiogenic Shock
Narrow QRS Regular atrial activity 240-360bpm Flutter waves (sawtooth) in lead II & III	Vagal manoeuvre: (as above) Adenosine: (as above) may disclose the flutter wave but will not terminate the tachyarrhythmia. Amiodarone: 5mg/kg IV over 30mins	Intubate and Ventilate Synchronised DC shock 1-2J/kg Amiodarone: 5mg/kg IV over 30mins
VENTRICULAR TACHYCARDIA (VT) NB: IF PULSELESS FOLLOW SHOCKABLE CARDIAC ARREST ALGORITHM		
ECG	Patient Stable (with pulse)	Cardiogenic Shock (with pulse)
Rate 120-300bpm Broad QRS VA dissociation	Magnesium: 25-50mg/kg over 20mins (max 2g) if torsade de pointes morphology Amiodarone: 5mg/kg IV over 30mins Consider synchronous DC Shock	Intubate and Ventilate Synchronised DC Shock 1-2J/kg Amiodarone: 5mg/kg IV over 5 mins
SEDATION AND INTUBATION FOR DC CARDIOVERSION		
<i>A combination of the below will provide deep sedation or general anaesthesia (reduced doses in the presence of shock)</i>		
Sedative	Opiate	Muscle Relaxant
Ketamine 1-2mg/kg	Fentanyl 1-2micrograms/kg	Rocuronium 1mg/kg
REFRACTORY ATRIAL TACHYARRHYTHMIA		
Treatment outside of APLS, please discuss immediately with WATCH and Cardiology teams before proceeding		
Intubate and ventilate to reduce the workload of the left ventricle and optimise oxygenation Continue maintenance Amiodarone infusion of 10-15micrograms/kg/min Consider IV calcium to prevent and treat side effects of amiodarone Inotropic support for decreased cardiac output (Dopamine / Adrenaline) Sedate and muscle relax +/- active cooling to reduce metabolic demand Move child to an appropriate setting whilst awaiting the WATCH Service		Amiodarone: Stable VT / SVT infuse 25 micrograms/kg/min for 4 hours, then 10-15 micrograms/kg/min. Acute side effects (potiated by low calcium): bradycardia, depressed cardiac function and hypotension
Dubin (2019) Management of Supraventricular Tachycardia in Children; Kanter (2019) Atrial Tachyarrhythmias in Children; APLS (2016)		