



GUIDELINE

Cardiac Dysrhythmias

Scope (Staff):	Nursing and Medical Staff
Scope (Area):	NETS WA

Child Safe Organisation Statement of Commitment

CAHS commits to being a child safe organisation by applying the National Principles for Child Safe Organisations. This is a commitment to a strong culture supported by robust policies and procedures to reduce the likelihood of harm to children and young people.

This document should be read in conjunction with this [disclaimer](#)

Aim

This guideline summarises features and treatment of cardiac dysrhythmias in neonates.

Risk

Delays in recognition and/or management of neonates with cardiac dysrhythmias can place neonates at increased risk of deterioration and adverse events. A standardised approach to assessment and management aims to minimise these risks.

Sinus Tachycardia

Sinus Tachycardia the most common tachycardia with heart rates 180-220 beats per minute. It can be difficult to differentiate from a supraventricular tachycardia (SVT), refer to Table 1 on the next page.

Common causes of sinus tachycardia are

- Low cardiac output due to hypovolaemia/cardiac tamponade.
- Respiratory e.g. pneumothorax
- Seizures: other signs may not be obvious. Consider in at risk situations.
- Pain/agitation especially post op (normal BP, lactate, urine output)
- Fever and/or sepsis.
- Drugs e.g. Caffeine

Sinus Tachycardia Treatment

Treat the underlying cause.

	Sinus tachycardia	Supraventricular tachycardia
Heart rate	Usually <220	>220
Onset	Gradual	Abrupt
Physical examination	Signs of underlying cause (i.e. fever, hypovolemia)	Signs of heart failure if long standing (oedema, crepitation, hepatomegaly)
ECG	Presence of upright p wave in lead I/aVF	P wave absent/abnormal, inverted in leads II,III or aVF.
Cardiac monitoring	Variability in heart rate with stimulation or treatment	Minimal variability in heart rate Increasing lactate

Table 1: Features of Sinus tachycardia and Supraventricular Tachycardia

Supraventricular Tachycardia (SVT)

- SVT is a common arrhythmia in neonates. There is an atrial ectopic site which has a faster intrinsic rate than the sinus node.
- SVT may initially be asymptomatic, but when prolonged it may result in congestive cardiac failure and shock after a variable period.

Features of SVT

- Sudden onset/offset.
- Rate constant and regular ~240bpm.
- May have history of fetal tachycardia.
- A delta wave and a short P-R interval seen on the baseline ECG in sinus rhythm in a neonate who has SVT makes the diagnosis of Wolff-Parkinson-White syndrome

Figure 1. SVT. Narrow QRS tachycardia with a ventricular rate of 245 beats/min is shown. Retrograde P waves (arrows) are shown in the ST segment in lead II.

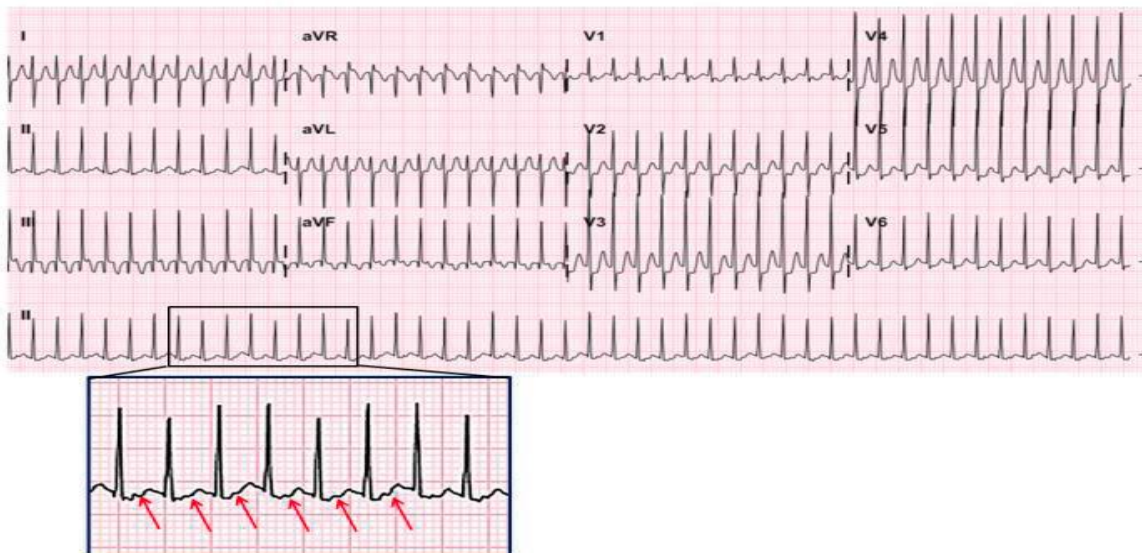
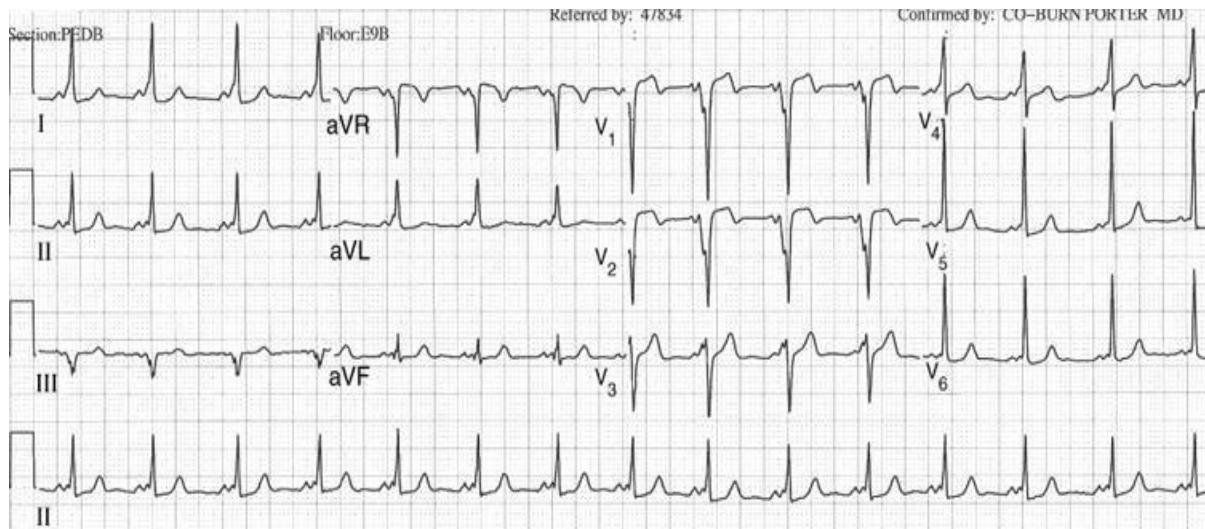


Figure 2. WPW ECG. Delta waves in leads I, II, aVR, aVL, V1-6. Mark the short PR intervals.



SVT Treatment and Management

- Review blood gas analysis, glucose, electrolytes (sodium, potassium, ionised calcium, magnesium) and correct if required.
- Review lactate which would give an impression about systemic compromise.

If clinically **asymptomatic** (no cardiac failure) and short transport:

- Close observation.
- IV access in case of clinical deterioration, draw up first dose of [Adenosine](#).

If clinically **symptomatic** (e.g. cardiac failure) or prolonged transport:

- Always consult the on-call neonatologist and/or cardiologist.
- If shocked or in cardiac failure, may require intubation, supplementation oxygen.
- Vagal manoeuvres (e.g. cold pack over face):
 - Apply cold pack to face, be careful of eyes (maximum 30 seconds) and do not hold on face too long as cold pack can 'burn' an infant's skin.
 - Do not put pressure on eyeballs as this can result in retinal detachment.
 - Do not use carotid sinus massage as this may compromise cerebral circulation.
- [Adenosine](#) fast IV push followed by a flush using a three way
 - Use an IV line closer to the heart (brachial if possible). If unresponsive, increase the dose according to neonatal medication monograph.

- Cardioversion and other antiarrhythmic drugs like Amiodarone/ Flecainide rarely required, and only when all above has failed, and patient in cardiac failure.
- Cardiologist must be consulted before cardioversion.
- If in cardiac failure: diuretics ([Furosemide](#)).

Adenosine

- The drug of choice for narrow complex tachycardia. This is both therapeutic and sometimes diagnostic. Technique is important due to a very short half-life.
- The main cause of [adenosine](#) “non-response” is incorrect administration technique. If the technique is correct and the child does not revert to sinus rhythm after the maximum dosage, you should review your initial diagnosis and contact cardiology for further management (Is it atrial tachycardia/atrial flutter, JET, fascicular VT?).
- Adenosine is contraindicated in adenosine-deaminase deficiency, which is a rare form of immune deficiency.
- If these measures fail to revert the SVT consult cardiology to consider alternative diagnosis and/or 2nd line treatment like Flecainide, Amiodarone or Procainamide.

Flecainide

- Flecainide is a membrane stabilizing anti-arrhythmic agent and a commonly used second line drug. **Flecainide is not routinely carried in the NETS bag and needs to be taken from the ADM on 3B if needed.**
- Refer to [Flecainide](#) Neonatal Medication Monograph for dosages.

Bradycardias

- Heart Rate < 100.
- In premature infants, most common cause is sinus bradycardia secondary to apnoea of prematurity. Heart rate responds appropriately to stimulation.
- In term infants, most common cause is sinus bradycardia in a relaxed baby. HR responds appropriately to stimulation.

Pathological causes include:

- Congenital heart block (does the mother have SLE?).
- Pre-arrest.
- Hypothermia (e.g. when cooled for Hypoxic Ischemic Encephalopathy).
- Hypothyroidism.
- Raised intracranial pressure.
- IV Calcium given too quickly.
- Hyperkalaemia.

Management of Bradyarrhythmias

If clinically asymptomatic (no cardiac failure, good perfusion, normal lactate, heart rate response with stimulation):


- Preterm infants: loading dose of [Caffeine](#)
- Term infants: close observation, no treatment needed.

If clinically symptomatic (cardiac failure, poor perfusion, worsening lactate, no response with stimulation or caffeine):

- Always consult the on-call neonatologist and/or cardiologist.
- [Resuscitation Algorithm for the Newborn](#).
- In preterm infants, if likely secondary to apnoeas and not responding to stimulation / caffeine, will require intubation and ventilation.
- In term infants, consider intubation and ventilation.
 - May require [Isoprenaline](#) - **after discussion with cardiology**.

Related CAHS internal policies, procedures and guidelines
<p>Neonatology Guidelines:</p> <p>Arrhythmias and Cardiac Arrest on NICU: Treatment Algorithms</p> <p>Cardioversion and Defibrillation</p> <p>Resuscitation Algorithm for the Newborn.</p> <p>WNHS Neonatal Medication Protocols</p>

This document can be made available in alternative formats on request.

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