



**NCCU CLINICAL GUIDELINES**  
**SECTION: 14**

**NEONATAL CARDIAC CONDITIONS:**

**SURGICAL AND MEDICAL MANAGEMENT**

Section 14: Neonatal Cardiac Conditions  
Cardiac Arrhythmias  
Date Revised: 2002

Neonatology Clinical Guidelines  
King Edward Memorial/Princess Margaret Hospitals  
Perth Western Australia

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**CARDIAC ARRHYTHMIAS**

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**SINUS BRADYCARDIA**

Regular heart rate < 90 bpm awake or < 80 bpm asleep.

**EPIDEMIOLOGY**

Common, transient.

**PATHOPHYSIOLOGY**

- High vagal tone in newborns.
- Raised intracranial pressure presenting with bradycardia rare.

**CLINICAL PRESENTATION**

- Normal sinus rhythm.
- Normal rate variation with respiration, stress, activity.
- Normal CVS examination.

**INVESTIGATION**

12 lead ECG to exclude AV (Heart) Block.

**MANAGEMENT**

Cardiac opinion if structural heart disease suspected.

**PROGNOSIS**

Excellent, transient, resolves over few days.

**ATRIAL ECTOPIC BEATS**

(AEB's, APB's, AEC's).

## **DEFINITION**

Narrow complex premature contractions focus away from the sinus node.

## **EPIDEMIOLOGY**

Common, 1-2% normal newborns and infants.

## **PATHOPHYSIOLOGY**

- Structural heart disease generally absent.
- Electrolyte disturbance.

## **CLINICAL PRESENTATION**

Irregular pulse, normal rate.

## **FINDINGS**

Normal CVS examination usual.

## **COMPLICATIONS**

- Haemodynamic disturbance/hydrops uncommon.
- Atrial bigeminy frequent.
- Blocked APB's may mimic sinus bradycardia, AV block.
- Progression to SVT uncommon.

## **INVESTIGATIONS**

- 12 lead ECG.
- Cardiac consult if structural heart disease suspected.

## **MANAGEMENT**

Nil required.

## **PROGNOSIS**

Excellent.

## **VENTRICULAR ECTOPICS**

(VEB's, VPB's, PVC's).

## **DEFINITION**

- Premature wide complex beats, arise from ventricular focus.
- AV dissociated, inverted T wave.

## **EPIDEMIOLOGY**

VEB's common, occur 1-2% normal newborns.

## **PATHOPHYSIOLOGY**

- May relate to normal transient high vagal tone.
- Electrolyte disturbance occasionally presents with VEB's.
- Generally arise in structurally and functionally normal hearts.
- Rarely associated with structural heart disease.

- Includes Cardiac tumours in Tuber Sclerosis.

## **CLINICAL PRESENTATION**

Irregularly irregular pulse.

## **FINDINGS**

Normal CVS examination usual.

## **COMPLICATIONS**

- Ventricular bigeminy common and benign.
- Haemodynamic compromise uncommon.
- Progression to ventricular tachycardia rare.

## **INVESTIGATIONS**

12 lead ECG.

Cardiac consult if structural heart disease suspected.

## **MANAGEMENT**

Nil.

## **PROGNOSIS**

Relates to associated structural/functional abnormality.

## **SUPRAVENTRICULAR TACHYCARDIA**

### **DEFINITION**

Narrow complex tachycardia rate >230 bpm, regular with hidden, normal or retrograde P waves, occasionally wide complex associated with aberrancy.

### **PATHOPHYSIOLOGY**

- Generally occurs in structurally normal heart.
- Rarely associated with CHD.
- May present in utero with hydrops.
- AV re-entry +/- accessory pathway Wolf Parkinson White (WPW) usual/common mechanism.
- Atrial Flutter, Atrial ectopic tachycardia less common.

### **CLINICAL PRESENTATION**

- Generally haemodynamically stable, asymptomatic if duration < 6 hrs.
- Duration > 6 hrs increasing likelihood symptoms ( poor feeding, respiratory distress, pallor).
- Rarely present in shocked, hypotensive, acidotic state.

### **FINDINGS**

- Tachycardia generally >230 bpm.
- Respiratory distress, pallor, hypotension, acidosis.

### **INVESTIGATIONS**

- 12 lead ECG.
- ECG strip recording during reversion.

- IV Adenosine may be diagnostic in Flutter, wide complex SVT.

## MANAGEMENT

- Vagal manouveres include facial icy water.
- IV Adenosine can be used safely even in presence of haemodynamic compromise.
- Digoxin, Flecainide may be used if stable and don't respond.
- Synchronised DC cardioversion in emergency.
- Digoxin 1<sup>st</sup> line chronic therapy.
- Propranolol, Flecainide, Sotolol 2<sup>nd</sup> line.

## PROGNOSIS

- Excellent, generally resolves over 9-12/12.
- Small number recur later in life, typically 7-12 yrs.

## COMPLETE AV (HEART) BLOCK

### DEFINITION

Abnormality atrio-ventricular conduction.

### EPIDEMIOLOGY

Uncommon, Congenital CHB 1 PER 20000.

1 <sup>0</sup>	Rarely structural heart disease. An example of 1 <sup>0</sup> heart block is Ebsteins anomaly
3 <sup>0</sup>	Maternal autoantibodies (lupus), Anti Ro, Anti La, Associated complex CHD – Left Atrial Isomerism, Corrected Transposition, (AV/VA discordance)
2 <sup>0</sup> 3 <sup>0</sup>	Rare, presentation in LQTS

### CLINICAL PRESENTATION

May present in utero with bradycardia/hydrops.

### FINDINGS

- Relative bradycardia, abnormal responses to stress, activity.
- HR generally < 80 awake or asleep.
- AV dissociation.
- Narrow complex escape rate usual in newborns, infants children.

### COMPLICATIONS

- Haemodynamic compromise.
- Relates to associated CHD.
- Relates to rate, common if rate < 60 in normal heart.
- Lower rates may not be tolerated in abnormal heart.
- Lupus related CHB associated with dilated cardiomyopathy ~5%.

### MANAGEMENT

- 12 lead ECG.
- Cardiac consultation.

## **PROGNOSIS**

- Pacing if symptomatic, HR < 55- 60, frequent VPB's, LQTS.
- Prognosis guarded.
- Poor if associated with CHD, presents with hydrops.