

Biventricular Cardiac Clinical Pathway

Ages 4+ to 15 years

(Expected post-operative length of stay 5 days)

Pathway Goals of Care

Early extubation

Adequate analgesia

Early mobilisation

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none"> • Biventricular surgery: <ul style="list-style-type: none"> • ASD - primum, secundum • VSD - inlet, outlet, muscular • Aortic and mitral valve repairs • Conduit replacement • Subaortic membrane • AV canal • Tetralogy of Fallot • Arch repairs 	<ul style="list-style-type: none"> • Children less than 4 years of age • Children over 15 years of age • Single ventricles • Non-bypass surgery • Rheumatic Heart Disease surgery
Pathway Instructions	
Pathway	<ul style="list-style-type: none"> • Keep the pathway in the front of the clinical notes (observation chart folder on 23B) at all times • Handover the pathway between shifts to ensure everyone is following it • Discuss the pathway at ward rounds • Complete the pathway each day and place a V or x or N/A in the <input type="checkbox"/> to confirm if a clinical care goal has been achieved • If the PICU post-operative course has been longer than expected, continue to refer to the pathway as a guide for post-op care on transfer back to ward 23b.

Ensure routine nursing cares such as the admission checklist, wound care, hygiene (including bowel care), mobilisation and pressure injury care are maintained, as well family/whānau education and orientation to the ward/unit environment.

Instructions: place a **V** or **x** or **N/A** in the to confirm if a clinical care goal has been achieved (**V**) or not (**x**) each day, or **N/A** if not applicable.

Action:	Date:	Location:	AM/PM/Ne			
Pre-operative Management:	<ul style="list-style-type: none"> • Interpreter organised if required (<i>arrange pre-admission if able</i>). • Medications reviewed and withheld as per the 'Cardiac Surgery –admission process guideline'. • Check the consent form has been completed – inform CCN/coordinator if this has not been completed by 5pm. • NBM as per Starship fasting guideline. • Admitting doctor has completed the 'Pre-op Cardiac Surgical Checklist'. • Complete pre-operative paperwork. • Complete the 'Ward 23b Admission and Discharge Checklist' (including the anti-staph bundle). 		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	Pre-Op Surgical Planner for PCCS - Pre-admission notes:
Clinical Management:	<ul style="list-style-type: none"> • Does patient have any of the following <ul style="list-style-type: none"> • Temp > 37.5°C • Signs of chest infection • Infected skin lesions • Vomiting /diarrhoea for the last 24 hours • Infectious contact. i.e. chicken pox, measles. • Dental caries • If yes to any of the above contact the surgical fellow/registrar to review the patient. • Surgery Deferred? Yes / No (circle) 		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	
Comments:						

Post-operative PICU Cares – Biventricular Pathway

Day 0 PICU until day of transfer

Date: _____

PICU Day 0 Post-op until transfer to ward 23b:			
On return to PICU post-operatively follow standard PICU Clinical guidelines for care.			
In addition consider the following goals (achieved v/ not achieved x) until transfer to the ward occurs:			
	Goal: Post-Op Day	v/x	AM/PM/Ne
Diagnostic Tests			
• Routine bloods.	0+		
• CXR (on return from OT and post pleural drain removal, or if clinically indicated).	0		
• ECG (routine for all patients)	1		
For MV repair/replacement and left AV valve surgery:			
• ECG (<i>off pacing if able, with pacing if pacing dependent</i>) within 4 hours of arrival to PICU and reviewed by the SMO.	0		
<i>*If ischaemic changes on ECG, or pacing dependent, consider serial troponins 6 hours apart</i>			
• TTE on return to PICU if circumflex or lateral wall not adequately imaged on post-bypass TOE.	0		
Airway			
• Extubate as per EXACT protocol.	0		
• Maintain O ₂ sats 93-98%	0+		
Drains			
• Remove chest drains as per PICU guidelines.	1		

Medications			
• Cephazolin – 2 doses post-op	0+		
• Diuretics: IV frusemide 12 hourly.	1+		
• Potassium sparing diuretic once daily.	1+		
• Paracetamol 6 hourly and 8 hourly ibuprofen (+morphine infusion as prescribed).	0+		
Input			
• Discontinue IV maintenance post extubation.	0		
• No fluid restriction.	0+		
• Commence oral intake as tolerated.	0+		
Comments:			

Transfer to Ward 23b (Goal Post-op day 1) Date: _____

On the day of transfer to ward 23b ensure the following :	√/x AM/PM/Ne		
Diagnostic Tests/Education			
Routine bloods.			
ECG prior to ward round.			
Chest x-ray post drain removal or if clinically required.			
Invasive Lines/Equipment			
Remove: Arterial line			
All peripheral IV cannulas.			
Leave CVL in situ.			
Ward 23b – remove urinary catheter at 2000hrs.			
Airway			
Wean O ₂ to maintain SpO ₂ >93-98%.			
Chest Drains			
Remove chest drains as per PICU guidelines.			
Suction is continued on 1kPa for any remaining Redax drains; ensure drain is well secured to the patient			
Medications			
• Commence laxatives if bowels have not opened by day 2 post-op.			
Continue IV frusemide 12 hourly.			
Continue potassium sparing diuretic once daily.			
Continue 6 hourly paracetamol and 8 hourly ibuprofen.			
PRN oral morphine			
PICU –oral dose of PRN morphine after stopping morphine infusion.			
Fluids			
No fluid restriction.			
Weigh before transfer to ward 23b.			
Nutrition			
Support breast/ oral feeding.			

Wounds			
Leave dressings/glue intact.			
Other			
PICU Nursing Discharge (CR9200) completed.			
Comments:			

Goals Post-op Day 2 – Ward 23b

Date: _____

Goals Post-op Day 2 – Ward 23b

Instructions: place a \checkmark or \times or N/A in the column to confirm if a clinical goal has been achieved (\checkmark) or not (\times) each day, or N/A if not applicable.			
Diagnostic Tests/Education	v/x AM/PM/Ne		
Bloods as clinically indicated (U+E if on diuretics, coags if indicated). CXR if clinically indicated or post pleural drain removal. ECHO prior to discharge. Commence discharge education.			
Invasive Lines/Equipment			
Routine preparation for pacing wire removal on day 3.			
Airway			
Maintain SpO ₂ >93-98%.			
Monitoring			
Discontinue telemetry if the child is: -Alert -Electrolytes within normal limits -Sinus rhythm for the last 24hours -Clinically stable Continue pulse oximetry monitoring			
Chest Drains			
Remove drains if losses are less than 4mls/kg/drain/day for 2 consecutive days, no bubbling and as instructed by the surgical team. • Suction is continued on 1kPa for any remaining Redax drains; ensure drain is well secured to the patient			
Comments:			

Medications	v/x AM/PM/Ne		
<ul style="list-style-type: none"> Review medications. Consider starting aspirin, sildenafil and antiarrhythmics if clinically indicated. Commence laxatives if bowels have not opened by day 2 post-op. 			
Transition to oral frusemide 12 hourly*. Continue potassium sparing diuretic once daily. 6 hourly paracetamol. 8 hourly ibuprofen. PRN oral morphine. <i>*Consider reducing diuretics if: absorbing feeds, no evidence of CHF, weight is tracking back towards pre-op weight – or if clinical signs of dehydration</i>			
Fluids			
No fluid restriction Daily weight.			
Nutrition			
Support breast/oral feeding.			
Wounds			
Wound review with the surgical team.			
Mobilisation/Handling			
Up to caregivers lap for feeding. Encourage normal developmental play. Daily wash with assistance provided to parents for all cares as needed.			
Comments:			

Goal Post-op Day 3 until discharge – Ward 23b

Date: _____

Instructions: place a v or x or N/A in the column to confirm if a clinical goal has been achieved (v) or not (x) each day, or N/A if not applicable.			
Diagnostic Tests/Education	v/x AM/PM/Ne		
Bloods as clinically indicated (U+Es if on diuretics, coags if indicated). CXR if clinically indicated or post pleural drain removal. ECHO prior to discharge. Continue discharge education.			
<ul style="list-style-type: none"> Consider repeating CXR if abnormalities are present on post-op CXR, consider PA and lateral views. Ensure a post-op extubated CXR is done prior to discharge. 			
Invasive Lines/Equipment			
Remove pacing wires (goal post-op day 3). Remove remaining peripheral IV (unless still receiving IV medications) 4 hours post pacing wire removal.			
Airway			
Maintain SpO ₂ >93-98%.			
Monitoring			
Monitor for 2 hours post pacing wire removal. Discontinue pulse oximetry 2 hours post pacing wire removal if stable.			
Chest Drains			
Remove drains if losses are less than 4mls/kg/drain/day for 2 consecutive days, no bubbling and as instructed by the surgical team.			
<ul style="list-style-type: none"> Suction is continued on 1kPa for any remaining Redax drains; ensure drain is well secured to the patient 			
Comments:			

Goal Post-op Day 3 until discharge – Ward 23b

Medications	v/x AM/PM/Ne		
<ul style="list-style-type: none"> Review medications. Consider starting aspirin, sildenafil and antiarrhythmics if clinically indicated. Commence laxatives if bowels have not opened by day 2 post-op. 			
Continue oral frusemide 12 hourly*. Continue potassium sparing diuretic once daily. 6 hourly paracetamol. PRN ibuprofen (no more than 1 week of treatment). Discontinue oral morphine.			
*Consider reducing diuretics if: absorbing feeds, no evidence of CHF, weight is tracking back towards pre-op weight – or if clinical signs of dehydration			
Fluids			
No fluid restriction. Daily weight.			
<ul style="list-style-type: none"> If oral intake is less than 70ml/kg/day discuss with medical team 			
Nutrition			
Support breast/oral feeding.			
Wounds			
Review all wounds daily. Surgical team review pre-discharge. Chest drain sutures removed day 7-10 post-op			
Mobilisation/Handling			
Support as much normal developmental play as possible. Support family to care for the child independently. Daily wash with assistance provided to parents for all cares as needed.			
Comments:			

Patient Label

Day of Discharge Ward 23b cares

Date: _____

Post Discharge Management

Instructions: place a V or x or N/A in the column to confirm if a clinical goal has been achieved (v) or not (x) each day, or N/A if not applicable.			
Discharge criteria	v/x AM/PM/Ne		
Tolerating normal home diet. Ward 23b discharge checklist completed. Review medication prior to discharge <ul style="list-style-type: none"> Regular paracetamol on discharge Review the need for diuretics on discharge with the cardiologist. Wound review and removal of chest drain sutures if present arranged for day 7-10 post op. If the sternal wound has interrupted/continuous sutures, removal of sutures is arranged by the surgical team at 14 days. Post-op ECHO completed.			
Discharge Referrals			
Home care nursing referral. Neurodevelopment referral (see 'neurodevelopment follow up of cardiac patients' guideline). Routine check by GP within the first week of discharge.			
Comments:			

On-going follow-up	v/x AM/PM/Ne		
Refer to the 'Follow up after Cardiac Surgery' guideline. Consider early discharge follow-up in discussion with the cardiologist* (circle the outcome below). <i>*e.g. to exclude pulmonary effusions</i> Follow-up with: Cardiologist OR Paediatrician in: Early Follow-up (<4 weeks) OR Routine follow-up (approx 4 weeks)			
Comments:			