Te Whatu Ora Health New Zealand Te Toka Tumai Auckland | Starship Child Health

Patient Label

Biventricular Cardiac Clinical Pathway

Ages 1+ to 4 years

(Expected post-operative length of stay 5 days)

Pathway Goals of Care

Early extubation

Drain removal

Adequate analgesia

Early mobilisation

Inclusion Criteria	Exclusion Criteria

• Biventricular surgery:
  • Isolated ASDs/VSD's (inlet, outlet, muscular)
  • AVSD
  • Tetralogy of Fallot with preservation of pulmonary valve
  • Simple pulmonary valvotomy
  • Simple valve procedure
  • Arch repairs
	• Children less than 1 year of age
	• Children over 4 years of age
	• TGA +/- VSD
	• Single Ventricle Physiology
	• Surgery for Rheumatic Heart Disease

Pathway Instructions	
Pathway	• 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 √ or x or N/A in the □ 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.

Patient Label

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

Action:	**Date:**	**Location:**	**AM/PM/Ne**			
Pre-operative Management:	• Interpreter organised if required *(arrange pre-admission if able).*		☐	☐	☐	**Pre-Op Surgical Planner for PCCS - Pre-admission notes:**
	• 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).		☐	☐	☐	
Clinical Management:	• Does patient have any of the following					
	• Temp > 37.5^{0}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)**					
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:
Follow standard PICU Clinical guidelines for care.
In addition consider the following goals (achieved √/ not achieved x) until transfer to the ward occurs:

	Goal: Post-Op Day	√/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 *(off pacing if able, with pacing if pacing dependent)* within 4 hours of arrival to PICU and reviewed by the SMO.	0			
***If ischaemic changes on ECG, or pacing dependent, consider serial troponins 6 hours apart**				
• 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				
• No fluid restriction.	0			
• Commence oral fluids.	0+			
• Commence light diet as tolerated.	0+			

Comments:

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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 Urinary catheter. CVL (leave x1 peripheral IV access on transfer to 23b)			
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 frusemide IV 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 a soft/light diet.			
Wounds			
Leave dressings/glue intact.			

Other			
PICU Nursing Discharge (CR9200) completed.			

Comments:

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Goals Post-op Day 2 – Ward 23b Date: _____

Goals Post-op Day 2 – Ward 23b

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

Diagnostic Tests/Education	√/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 • Review medications. Consider starting aspirin, sildenafil and antiarrhythmics if clinically indicated. • Commence laxatives if bowels have not opened by day 2 post-op.	√/x AM/PM/Ne		
Transition to **oral** frusemide 12 hourly*. Continue potassium sparing diuretic once daily. 6 hourly paracetamol. 8 hourly ibuprofen. PRN 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.			
Nutrition			
Encourage and support a soft/light diet.			
Wounds			
Wound review with the surgical team.			
Mobilisation/Handling			
Mobilise into a chair for all meals. Mobilise out of the room. Daily wash with assistance provided to parents for all cares as needed.			
Comments:			

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

Date: _____

Instructions: place a √ or x or N/A in the column to confirm if a clinical goal has been achieved (√) or not (x) each day, or N/A if not applicable.			
Diagnostic Tests/Education	**√/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. • **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 any remaining peripheral IV *(unless still receiving IV medications).*			
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. • **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 • Review medications. Consider starting aspirin, sildenafil and antiarrhythmics if clinically indicated. • Commence laxatives if bowels have not opened by day 2 post-op.	**√/x AM/PM/Ne**		
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. • **If oral intake is less that 70ml/kg/day discuss with medical team**			
Nutrition			
Encourage and support normal diet.			
Wounds			
Review all wounds daily. Surgical team review pre-discharge. Chest drain sutures removed day 7-10 post-op.			
Mobilisation/Handling			
Mobilise into a chair for all meals. Out of bed and encourage normal developmental play. Mobilise the child as much as possible (at least 3 walks per day). Daily wash with assistance provided to parents for all cares as needed.			
Comments:			

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Day of Discharge Ward 23b cares Date:_____ Post Discharge Management

Instructions: place a √ or x or N/A in the column to confirm if a clinical goal has been achieved (√) or not (x) each day, or N/A if not applicable.			
Discharge criteria	**√/x AM/PM/Ne**		
Tolerating normal home diet. Ward 23b discharge checklist completed. Review medication prior to discharge • 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	**√/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).** **e.g. to exclude pulmonary effusions* **Follow-up with: Cardiologist OR Paediatrician** **in: Early Follow-up (<4 weeks) OR Routine follow-up (approx 4 weeks)**			
Comments:			