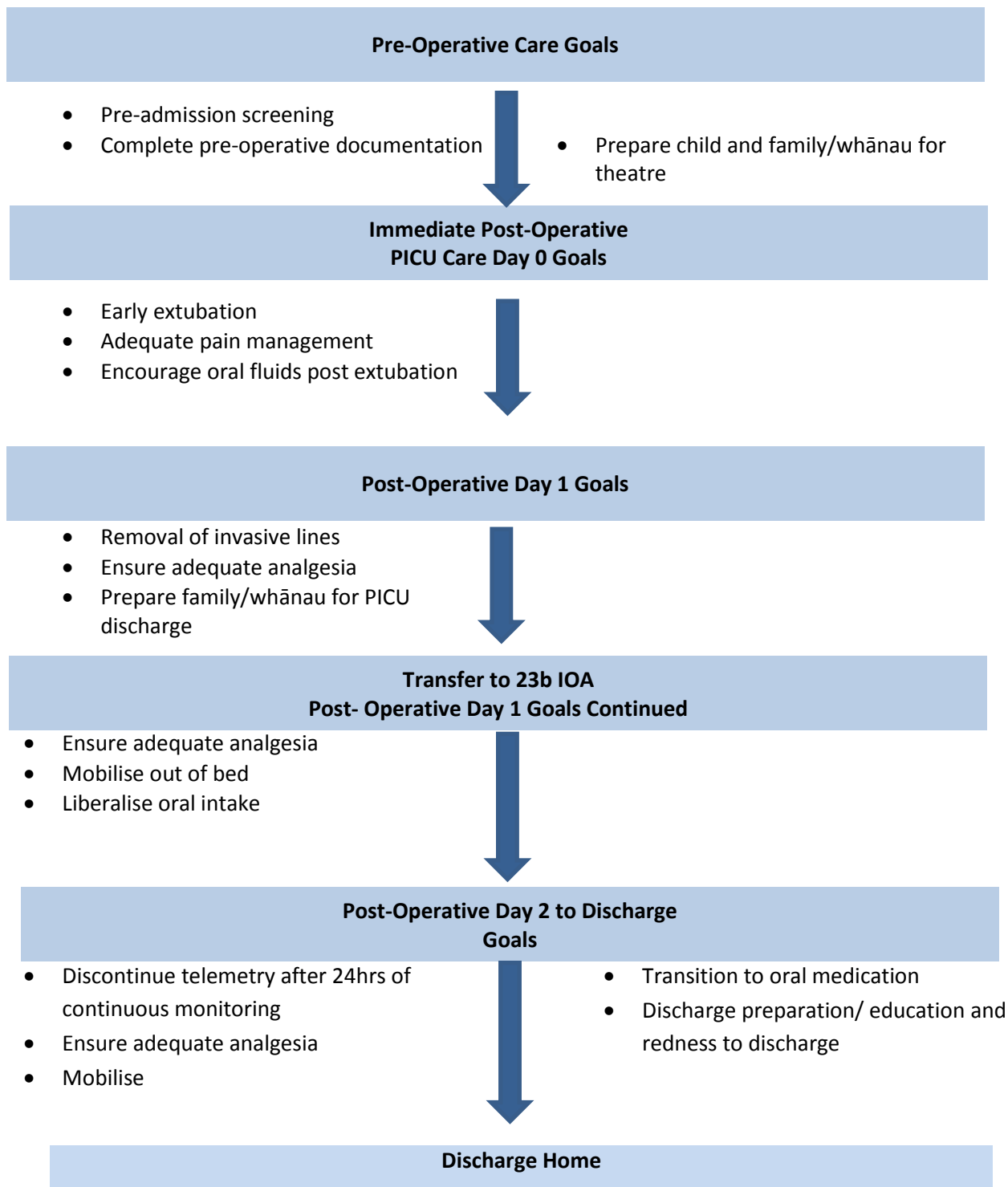


Biventricular Pathway for 5-15 years

Expected length of stay 5 days



Biventricular Clinical Pathway Inclusion/Exclusion Criteria

Inclusion Criteria

5-15 years of age
ASD -primum, secundum
Aortic and mitral valve repairs
Subaortic membrane
Conduit replacement
VSD -inlet,outlet, muscular
AV canal
Tetralogy of Fallot

Yes

Patient eligible clinical pathway

Document patient is to follow the clinical pathway in the notes

No

Exclusion Criteria

Single ventricles
1 1/2 ventricle repairs
Children less than 5 years
Severe ventricular dysfunction
Non bypass surgery

Patient is not eligible to commence the clinical pathway

Variance

- The purpose of the variance record is to track and document variances from the clinical pathway

Pre-Operative Care

Goals: Prepare pre-operative admission and documentation
Family/whānau education

Date	AM	PM		Clinical/Care decisions
Preadmission screening			<ul style="list-style-type: none"> Commence anti-staph bundle, if swabs are positive or not available Overseas patients <ul style="list-style-type: none"> MRSA + MSSA screening (nasal and groin swab), MRO screening (rectal/faeces swab) Patients transferred from other hospitals <ul style="list-style-type: none"> MRSA + MSSA screening 	MRSA/MSSA results available Yes/No Mupirocin commenced Yes/No
Medication management			<ul style="list-style-type: none"> Withhold ACE inhibitors and diuretics once NBM Antiarrhythmic and beta blocker should be given with a small sip of water unless specified by anaesthetist Aspirin should have been stopped 2-5 days prior to surgery Clopidogrel is stopped 5 days prior to surgery Anti-staph bundle – Mupirocin treatment Pre-medication charted 	
Pre-operative preparation			<ul style="list-style-type: none"> Medical admission (see cardiac surgery admission guideline) Organise interpreter for consent if required If consent not completed done by 5pm Clinical Charge Nurse to follow up Shower and chlorhexidine wipe the night prior to surgery and morning of surgery Pre-op Checklist Completed (see cardiac surgery admission checklist) Resus chart 	
Nutrition			<ul style="list-style-type: none"> Establish NBM times (see anaesthesia fasting guideline and cardiac surgery admission process guideline) 	

Clinical management

Does patient have any of the following

- Temp > 37.5
- Signs of chest infection
- Infected skin lesions
- Vomiting /Diarrhoea for the last 24 hours
- Infectious contact. i.e. Chicken pox, measles

Recommended action

- Contact surgical Fellow/Registrar to review patient
- Theatre delayed or cancelled
- Recommence pathway once theatre date confirmed
- Document action in the clinical notes

Day of Surgery PICU post-operative day 0

Goals: Early extubation
Ensure adequate analgesia

Date	AM	PM		Clinical/Care decisions
EXACT protocol			<ul style="list-style-type: none"> EXACT as per 2 or 6 hour protocol Administer supplemental O2 to maintain SpO2 >93-98% Identify patients suitable for early chest drain removal protocol on 20:00 ward round CLAB and Glamorgan 	Extubated as per EXACT protocol Yes/No
Pain management			<ul style="list-style-type: none"> Aim for MAP's pain score of <4 Follow PICU unintubated greater than 12 months or over 30kg analgesia and sedation algorithm 6 hrly paracetamol 8 hrly ibuprofen unless contraindicated - can be administered on an empty stomach Ondansetron if child has postoperative nausea or vomiting 	Regular 6 hrly paracetamol administered Yes/No Regular 8 hrly ibuprofen administered Yes/No
Fluid and diuresis			<ul style="list-style-type: none"> Discontinue IV maintenance fluids post extubation Accurate fluid balance 	
Nutrition			<ul style="list-style-type: none"> Once patient is cardiorespiratory stable, commence oral fluids and light diet as tolerated No fluid allowance necessary NG tube is not required in children > 5 years 	
Post-operative antibiotics			<ul style="list-style-type: none"> Cephazolin - 2 doses post-operative 	
Family/whānau support			<ul style="list-style-type: none"> Orientate Family/whānau to PICU Surgical education post PICU admission 	

Clinical management

- Diversion from the EXACT protocol, child no longer follows the pathway and care is managed as per care of the cardiac child PICU guideline

Recommended action

- Care as per care of the cardiac child PICU guideline
- Pain and sedation management as per PICU intubated >12months analgesia and sedation algorithm
- Recommence pathway once extubated

Post-Operative Day 1 PICU

Goals:

Ensure adequate analgesia
Removal of chest drains and invasive lines

Date	AM	PM		Clinical/Care decisions
Interventions			<ul style="list-style-type: none"> ○ Wean O2 to maintain SpO2 >93-98% ○ Remove chest drains at 06:00 if patient meets early chest drain removal criteria or post-surgical ward round ○ Ensure central line and foley catheter remain insitu ○ Post ward round remove <ul style="list-style-type: none"> - All peripheral cannulas - Arterial Line ○ Complete CLAB and Glamorgan bundle of care 	Removal of invasive lines except CVL and foley catheter Yes/No
Medication			<ul style="list-style-type: none"> ○ Discuss medication management during surgical ward round <ul style="list-style-type: none"> - Aspirin - Antiarrhythmics - Sildenafil 	
Fluid and diuresis			<ul style="list-style-type: none"> ○ Commence BD IV frusemide and potassium sparing diuretic if : <ul style="list-style-type: none"> - K+ and creatinine are normal - Accurate fluid balance 	
Pain management			<ul style="list-style-type: none"> ○ Follow PICU unintubated greater than 12 months or <30kgs sedation and analgesia algorithm ○ Aim for MAPS pain score <4 ○ 6 hrly paracetamol ○ 8 hrly ibuprofen unless contraindicated ○ Discontinue PCA once chest drains have been removed ○ Administer a dose of oral morphine post discontinuing PCA ○ Ondansetron if child has postoperative nausea or vomiting 	Regular 6 hrly paracetamol administered Yes/No Regular 8 hrly ibuprofen administered Yes/No PRN oral morphine given after stopping PCA Yes/No If not, why?
Mobilisation			<ul style="list-style-type: none"> ○ Mobilise up into a chair prior to chest drain removal 	
Nutrition			<ul style="list-style-type: none"> ○ Free oral fluids and soft/light diet as tolerated ○ No fluid restriction required 	
Diagnostic tests			<ul style="list-style-type: none"> ○ Chest x-ray post drain removal ○ Post-operative ECG prior to surgical ward round 	

Date	AM	PM		Clinical/Care decisions
PICU discharge documentation and patient handover			<ul style="list-style-type: none"> Medical team to review chest x-ray post drain removal prior to transfer Discharge documentation completed including PEWS score, pain team and PaR team referral if required. Medical staff to call 23b admission phone to verbally handover to Registrar/NP prior to transfer 	
Family/whānau support			<ul style="list-style-type: none"> Prepare family/whānau for PICU discharge family/whānau education 	

Clinical management <ul style="list-style-type: none"> Failure to discharge from PICU due to change in clinical status
Recommended action <ul style="list-style-type: none"> Patient resumes pathway on day 1 post-op once clinical status stable and ready for transfer to 23b

Post-operative Day 1 continued

Ward 23B

Goals:

- Adequate analgesia
- Mobilise out of bed
- Liberalise oral intake

Date	AM	PM		Clinical/Care decisions
Ward admission			<ul style="list-style-type: none"> ○ Wean O2 to maintain SpO2 >93-98% ○ Remove PIV if still insitu ○ Remove foley catheter at 20:00hrs ○ Continuous monitoring for 24 hours post admission ○ Medical admission, review diagnostics ○ Admit into a side room unless the child has one of the following <ul style="list-style-type: none"> - Arrhythmias - Requires external pacing - Antiarrhythmic infusion - Inotrope requirement 	Admitted to a side room Yes/No Rationale for decision
Fluid and diuresis			<ul style="list-style-type: none"> ○ Review BD frusemide and potassium sparing diuretic ○ Consider transitioning to oral diuretics ○ Accurate fluid balance 	
Pain management			<ul style="list-style-type: none"> ○ Use numerical or revised faces pain scale to assess pain score ○ 6 hrly paracetamol ○ 8 hrly ibuprofen unless contraindicated ○ Morphine PRN or Tramadol PRN ○ Ondansetron for nausea and vomiting 	Regular 6 hrly paracetamol administered Yes/No Regular 8 hrly ibuprofen administered Yes/No
Mobilisation			<ul style="list-style-type: none"> ○ Mobilise up into chair for all meals ○ Mobilise up to the toilet/mobilise around the bed ○ Support and encourage family/whānau to mobilise child 	
Daily needs bundle of care			<ul style="list-style-type: none"> ○ Glamorgan bundle of care ○ Hygiene needs/oral care 	
Nutrition			<ul style="list-style-type: none"> ○ Encourage oral fluids and soft/light diet as tolerated 	
Family/whānau support			<ul style="list-style-type: none"> ○ Initiate family/whānau discharge education ○ Support family/whānau to participate in child's care 	

Clinical management

- Failure to discharge from PICU due to ward capacity

Recommended action

- Patient continues on pathway in PHDU and can bypass the IOA if post-op day 1 goals have been achieved

Post-Operative Day 2

Or discharge if child meets discharge criteria

Goals:

Discontinue telemetry after 24hrs of admission
 Liberalise oral fluids and commence diet as age appropriate
 Ensure adequate analgesia
 Mobilise

	AM	PM	Day 2 Post Op Date	Clinical/Care decisions
Interventions			<ul style="list-style-type: none"> Remove CVL Discontinue telemetry if patient meets the below criteria <ul style="list-style-type: none"> Alert Electrolytes within normal levels Sinus rhythm within the last 24 hours Child is clinically stable and progressing as expected Check diagnostic tests are completed for removal of pacing wires on day 3 post-op If sternotomy dressing is dry, remove dressing clean wound and apply glue Commence lactulose OD if BNO 	CVL removed day 2 post-op Yes/No Telemetry discontinued day 2 post-op Yes/No If not, why?
Fluid and diuresis			<ul style="list-style-type: none"> Transition to oral diuretics BD or daily if <ul style="list-style-type: none"> Absorbing feeds No evidence of CHF Weight is tracking back towards pre-op weight No clinical signs of dehydration Daily weight Accurate fluid balance 	Transitioned to oral diuretics by day 2 post-op Yes/No
Pain management			<ul style="list-style-type: none"> Revised faces pain or the numerical rating scale 6 hrly paracetamol 8 hrly ibuprofen unless contraindicated Oral Morphine PRN or Tramadol PRN Ondansetron for nausea and vomiting 	Transitioned to oral PRN morphine Yes/No
Mobilisation			<ul style="list-style-type: none"> Continue to mobilise into chair for meals Mobilise out of the room in the playroom/ corridor Refer to physiotherapy if child is unable to sit out of bed by day 2 post-op 	Mobilisation out of the room by day 2 post-op Yes/No
Nutrition			<ul style="list-style-type: none"> Free fluids and light diet as tolerated 	Achieved free fluids and light diet by day 2 post op Yes/No
Diagnostic tests			<ul style="list-style-type: none"> Check FBC, U & E's, and coagulation screen if having warfarin 	
Daily needs bundle of care			<ul style="list-style-type: none"> Bath/ shower/ teeth / hygiene needs Glamorgan bundle of care 	
Discharge education			<ul style="list-style-type: none"> Medication education Wound education Signs of when to seek medical review Parental education commenced by day 2 post-op 	

Clinical management		
Arrhythmias Recommended action <ul style="list-style-type: none"> ○ Consult with Cardiologist ○ Delay pacing wire removal ○ Continue ECG monitoring ○ Check electrolytes 	Oxygen requirement from day 3 post op Recommended action <ul style="list-style-type: none"> ○ Clinical examination ○ Review last chest x-ray ○ Consider fluid overload 	Temperature > 38.5°C > 48 hrs post op Recommended action <ul style="list-style-type: none"> ○ Clinical examination ○ FBC and urine (blood cultures and chest x-ray not routinely required)

Post-Operative Day 3

Or discharge if child meets discharge criteria

Date:	AM	PM	Day 3 Post Op	Variance
Interventions			<ul style="list-style-type: none"> Remove pacing wires as per protocol if patient is clinically stable and progressing well Monitor for 2hours post pacing wire removal Remove dressings on drain sites if wounds are dry 	Pacing wires removed on day 3 post-op Yes/No If not, why?
Fluid diuresis			<ul style="list-style-type: none"> Continue with oral diuretics BD or daily Daily weight 	Transition to oral diuretics on 3 post-op Yes/No
Pain management			<ul style="list-style-type: none"> Revised faces pain or the numerical rating scale 6 hrly paracetamol PRN ibuprofen Oral Morphine PRN or Tramadol PRN Ondansetron for nausea and vomiting 	Transitioned to oral morphine Yes/No
Mobilisation			<ul style="list-style-type: none"> Continue to mobilise out of bed for meals Encourage as much mobilisation as possible/support family to mobilise the child independently 	
Nutrition			<ul style="list-style-type: none"> Free fluids Encourage home diet 	
Diagnostic tests			<ul style="list-style-type: none"> Echocardiogram prior to discharge Consider repeating CXR if abnormalities are present on post-op CXR, consider PA and lateral x-rays 	
Infection surveillance			<ul style="list-style-type: none"> Pyrexia of < 38.5 within 48 hours can commonly be associated with a SIRS response Ensure patient is hydrated and manage with paracetamol 	
Daily needs bundle of care			<ul style="list-style-type: none"> Bath/shower/oral hygiene Glamorgan bundle of care 	
Discharge education			<ul style="list-style-type: none"> 23b discharge check list completed Medication/Wound care and suture removal education Signs of when to seek medical review 	

Clinical management		
Arrhythmias Recommended action <ul style="list-style-type: none"> Consult with Cardiologist Delay pacing wire removal Continue ECG monitoring Check electrolytes 	Oxygen requirement from day 3 post op Recommended action <ul style="list-style-type: none"> Clinical examination Review last chest x-ray Consider fluid overload 	Temperature > 38.5°C > 48 hrs post op Recommended action <ul style="list-style-type: none"> Clinical examination FBC and urine (blood cultures and chest x-ray not routinely required)

Post-Operative Day 4 - Discharge

Goals:

Family/whānau is confident how to care for the child on discharge
 Child meets the discharge criteria
 Discharge referrals completed
 Family/whānau aware of discharge plan

Discharge criteria		<ul style="list-style-type: none"> ○ Ward 23b discharge check list completed ○ Review medication prior to discharge ○ Wound review and removal of sutures by the GP on day 7-10 post op ○ If the wound has interrupted sutures, removal of sutures is organised by the surgical team at 14 days 	Discharged by day 4 post-op Yes/No
Discharge referrals		<ul style="list-style-type: none"> ○ Home care nursing referral if required ○ Routine check by GP within the first week of discharge 	

Post Discharge Management

Post Discharge	Refer to SMO follow up guidelines
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