

**Pathway purpose:** To standardize the postoperative management of patients undergoing primary TOF repair

**Inclusion Criteria:**

Patients with TOF with confluent pulmonary arteries undergoing valve sparing or transannular patch TOF repair

**Exclusion Criteria:** (at least one of the following present)

- Pulmonary atresia
- < 35 weeks gestational age
- < 3.5 kilograms at time of surgery
- Preoperative critical illness (receiving vasoactives, positive pressure ventilation, or mechanical support)
- Experienced complicated or atypical operative course
- Other significant comorbidities as determined by clinical team

Develop individualized management plan with CVICU and CV surgery input

**Upon CVICU Admission:**

- Place TOF order set and Target Based Care (TBC) order
- Confirm that TBC sign is visibly posted outside patient room





 **Target Based Care**

- Extubate on/before POD 1 (≤ 24 hours)
- Transfer to acute care on/before POD 3
- Discharge on/before POD 5

**Daily:**

- Review daily care goals outlined below and completed as appropriate

## Postoperative Goals

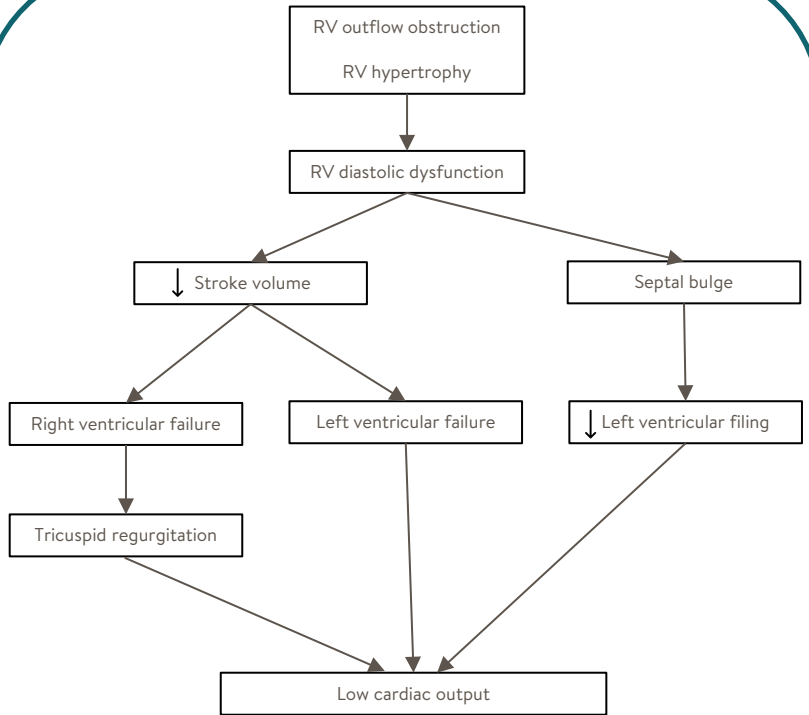
Intensive Care Unit Phase	<p><b>POD 0</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Achieve/maintain hemodynamic and respiratory stability</li> <li><input type="checkbox"/> Monitor and control bleeding</li> <li><input type="checkbox"/> Control pain and agitation</li> <li><input type="checkbox"/> Wean toward extubation</li> </ul>	<p><b>Acute Care Transfer Criteria</b></p> <ul style="list-style-type: none"> <li>▪ Stable hemodynamics off vasoactive infusions</li> <li>▪ Invasive monitoring lines removed</li> <li>▪ Appropriate respiratory status on nasal cannula or <a href="#">HFNC per pathway</a></li> <li>▪ Tolerating enteral feeds</li> <li>▪ Comfort managed without continuous IV medication</li> </ul>
	<p><b>POD 1</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> <b>Extubate</b> </li> <li><input type="checkbox"/> Wean/ discontinue vasoactive infusions</li> <li><input type="checkbox"/> Discontinue Foley</li> <li><input type="checkbox"/> Initiate diuresis</li> <li><input type="checkbox"/> Control pain/agitation</li> <li><input type="checkbox"/> Initiate clears/advance diet</li> <li><input type="checkbox"/> Evaluate for <a href="#">chest tube removal readiness</a></li> <li><input type="checkbox"/> Initiate transfer preparation and discharge education</li> </ul>	
	<p><b>POD 2</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Complete previous daily goals that are not complete</li> <li><input type="checkbox"/> Wean noninvasive respiratory support</li> <li><input type="checkbox"/> Discontinue central line and arterial line</li> <li><input type="checkbox"/> Remove sternal surgical site dressing</li> <li><input type="checkbox"/> Advance to regular diet</li> <li><input type="checkbox"/> Transition to PO pain medications</li> <li><input type="checkbox"/> Determine family barriers to care</li> <li><input type="checkbox"/> Transfer to acute care if eligible (<b>See criteria</b>) </li> </ul>	
Acute Care Unit Phase	<p><b>POD 3</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Complete previous daily goals that are not complete</li> <li><input type="checkbox"/> Complete postop echocardiogram (once chest tubes out)</li> <li><input type="checkbox"/> Wean diuretics</li> <li><input type="checkbox"/> Achieve regular diet</li> <li><input type="checkbox"/> Discontinue oxygen if possible</li> <li><input type="checkbox"/> Confirm education/discharge readiness plan</li> <li><input type="checkbox"/> Transfer to acute care if eligible (<b>See criteria</b>) </li> </ul>	<p><b>Discharge Criteria</b></p> <ul style="list-style-type: none"> <li>▪ Stable hemodynamics and exam on home regimen of medications x24 hours</li> <li>▪ Stable respiratory status on Room Air</li> <li>▪ Tolerating home feeding regimen</li> <li>▪ All medications given enteral</li> <li>▪ Discharge education and planning complete</li> </ul>
	<p><b>POD 4</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Complete previous daily goals that are not complete</li> <li><input type="checkbox"/> Confirm patient off telemetry</li> <li><input type="checkbox"/> Confirm patient home-going regimen</li> <li><input type="checkbox"/> Complete education/achieve discharge readiness (caretaker doing full care)</li> <li><input type="checkbox"/> Confirm discharge prescriptions picked up</li> <li><input type="checkbox"/> Confirm discharge appointments scheduled</li> </ul>	
	<p><b>POD 5</b></p> <ul style="list-style-type: none"> <li><input type="checkbox"/> Review home regimen</li> <li><input type="checkbox"/> Review follow up appointments</li> <li><input type="checkbox"/> Update referring cardiologist</li> <li><input type="checkbox"/> <b>Discharge</b> </li> </ul>	



Feedback?

**Postoperative complications:**

- Arrhythmias such as junctional ectopic tachycardia
- Post-operative bleeding
- Cardiac tamponade
- Low cardiac output syndrome, primarily from restrictive right ventricle (RV) physiology (See Figure)
- Residual lesions
  - Branch pulmonary artery stenosis
  - Residual RV obstruction (including from RV muscle bundle)
  - Residual or new ventricular septal defect



**Restrictive physiology in postoperative tetralogy of Fallot**

Pathway Measure	Target
Time to extubation	On or before POD 1
Time to transfer out of intensive care unit	On or before POD 3
Time to discharge home	On or before POD 5

**References:**

1. Hoffman TM, Wernovsky G, Atz AM, Kulik TJ, Nelson DP, Chang AC, Bailey JM, Akbary A, Kocsis JF, Kaczmarek R, Spray TL, Wessel DL. Efficacy and safety of milrinone in preventing low cardiac output syndrome in infants and children after corrective surgery for congenital heart disease. *Circulation*. 2003 Feb 25;107(7):996-1002. PMID: 12600913.
2. Kirsch RE, Glatz AC, Gaynor JW, Nicolson SC, Spray TL, Wernovsky G, Bird GL. Results of elective repair at 6 months or younger in 277 patients with tetralogy of Fallot: a 14-year experience at a single center. *J Thorac Cardiovasc Surg*. 2014 Feb;147(2):713-7. PMID: 23602127
3. Pasquali SK, Sun JL, d'Almada P, Jaquiss RD, Lodge AJ, Miller N, Kemper AR, Lannon CM, Li JS. Center variation in hospital costs for patients undergoing congenital heart surgery. *Circ Cardiovasc Qual Outcomes*. 2011 May;4(3):306-12. PMID: 21505154; PMCID: PMC3326639.
4. Kumar G, Iyer PU. Management of perioperative low cardiac output state without extracorporeal life support: What is feasible? *Ann Pediatr Cardiol*. 2010 Jul;3(2):147-58. PMID: 21234194; PMCID: PMC3017919.