



# Clinical Pathway: Cardiac Transplant

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Path initiated on \_\_\_\_\_  
(Date)

Expected length of stay: 10-14 days

Attending physician \_\_\_\_\_

*This pathway is a general guideline and does not represent a professional care standard governing provider's obligations to patients. Care is revised to meet the individual patient needs.*

## Eligibility Criteria - Terminal heart disease, no active infection

Timeline	Pre-op*	Day of Surgery*	Post-op Day #1
Unit/Dept.	CICU	OR/CICU	CICU
Date			
Assessment/Monitoring	Weight, Height, vital signs	Vital signs per routine	Vital signs per routine
Cardiac		CR monitor, CVP/RA, LA, A-line	CR monitor, CVP/RA, A-line
Resp/Pulm.	Assess breath sounds, O <sub>2</sub> sat.	✓ breath sounds, O <sub>2</sub> sat, CT drng	✓ breath sounds, O <sub>2</sub> sat, CT drng
Fluid status		Measure I&O. Foley. NG output.	Measure I & O. D/C Foley.
Diagnostics	CXR-PA & lateral EKG, H&P CBC/diff, renal panel, T&C, viral titers, PRA	On arrival in CICU: CXR, EKG, CBC, PT/PTT, renal panel, Glu, Mg, Ca <sup>++</sup> , ABG. Renal every 12 hrs. CBC every 8 hrs. ABG, K <sup>+</sup> , Ca <sup>++</sup> , lactate, MVO <sub>2</sub> every 4 hrs x 24 hrs.	CXR in a.m. (& post CT removal). Labs: CBC/diff, renal panel, Glu, Mg, Ca <sup>++</sup> & ABG, cyclosporine or tacrolimus level at 6 am ABG prn to extubation CBC, renal panel, Glu, Ca <sup>++</sup> bid
Medications/ IV therapy	Cyclosporine (Neoral®) or tacrolimus oral Vancomycin, Cefotaxime if inpatient	Immunosuppression: Cyclosporine or tacrolimus, Methylprednisolone, Azathioprine Dopamine, NTG, Milrinone +/-Isoproterenol for HR less than 100 Antibiotic (Cefazolin) x 3 doses Acyclovir or ganciclovir (G17[A]), Nystatin Furosemide, Ranitidine, Maalox® Morphine, midazolam IV maintenance fluids	Immunosuppression: Cyclosporine or tacrolimus, Methylprednisolone, Azathioprine. Dopamine, Milrinone. D/C NTG. +/- Isoproterenol for HR less than 100. D/C antibiotic (Cefazolin) Acyclovir or ganciclovir (G17[A]), Nystatin Furosemide, Ranitidine, Maalox® Morphine, midazolam IV maintenance fluids
Treatments/ Procedures	Bath with antibacterial soap	Cardiac transplant (+/- pacing for HR less than 100) Ventilator wean per protocol	Dressing check D/C LA CPT prn, incentive spirometry prn Extubation per protocol
Nutrition/GI	NPO on arrival if greater than 1 yr old; if less than 1 yr old, NPO for solids/full liquids 6 hrs prior to surgery. Clear liquids until 4 hrs prior to OR.	NPO (NG → low continuous suction)	Ice chips when awake & alert, Advance diet as tolerated.  (D/C NG)
Activity		Protective isolation	Protective isolation Bedrest
Consults/referrals	Anesthesia		
Psychosocial	Psychosocial assessment, Emotional support.	Family updated re: patient status. Patient comfort measures.	Family updated. Patient comfort measures.
Education	Transplant patient care per Transplant Patient and Family Education Manual. Routine pre-op teaching re: monitors, ventilator, tubes, etc.	Teaching re: CICU routines, care	Postoperative care.
Discharge planning			Education as above.

\*order set

[ ] Indicates strongest strength of evidence (see guideline for evidence scale)





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**EXPECTED OUTCOMES**

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Signatures/ Credentials													
Timeline	Pre-op			Day of Surgery			Post-op day #1						
Unit/Dept.	(outpatient) CICU			OR/CICU			CICU						
Date		D	E	N		D	E	N		D	E	N	
<b>Physiologic</b>	No signs of intercurrent illness. Pre-op tests completed.				Hemodynamic stability.  Stable respiratory status.					Hemodynamic stability. Patient is extubated with stable respiratory status. Extubation time _____ Chest tube removed without evidence of pneumothorax or effusion. No signs of infection.			
<b>Psychosocial/ Comfort</b>	Patient/family are prepared for surgery.				Family informed. Pain controlled.					Family/patient informed.  Increased patient activity with adequate pain control.			
<b>Educational</b>	Patient/family informed: *Evaluation process *Listing/Notification *Hospitalization *Immunosuppression: *Medications/side effects *Rejection/biopsy *Follow-up schedule				Family informed.					Family informed.			
<b>Other</b>													
<b>Outcome not met due to:</b>	Fever Respiratory Sx Parent anxiety Incomplete tests Lack of patient/family education  Other: _____				Arrhythmia Hypotension Decreased perfusion. Bleeding Fever Inadequate pain control Other: _____					Arrhythmia Decreased perfusion. ↑ Chest tube output/effusion Pneumothorax Fever Nausea/vomiting Inadequate pain control Other: _____ Failed extubation due to: Sedation Pneumothorax Other: _____			

**For each met outcome, initial = met**  
**\* = not met (see progress notes)**



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**Expected length of stay: 10-14 days**

**Attending physician \_\_\_\_\_**

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<b>Eligibility Criteria - Terminal heart disease, no active infection</b>			
<b>Timeline</b>	<b>Post-op day #2</b>	<b>Post-op day #3</b>	<b>Post-op day #4</b>
<b>Unit/Dept.</b>	CICU	CICU	CICU
<b>Date</b>			
<b>Assessment/Monitoring</b>	Vital signs per routine	Vital signs per routine	Vital signs per routine
<b>Cardiac</b>	CR monitor, CVP/RA, A-line	CR monitor, CVP/RA, A-line	CR monitor, CVP/RA
<b>Resp/Pulm.</b>	✓ breath sounds, O <sub>2</sub> sat	✓ breath sounds, pulse ox if O <sub>2</sub>	Assess breath sounds
<b>Fluid status</b>	Measure I & O. (CT drng)	Measure I & O	Measure I & O
<b>Diagnostics</b>	CXR in a.m. Labs: CBC/diff, renal panel, Glu, Mg, Ca <sup>+</sup> & ABG, MVO <sub>2</sub> Cyclosporine or tacrolimus level at 6 am Renal panel, Glu, Ca <sup>++</sup> bid	CXR in a.m. Labs: CBC/diff, renal panel, Glu, Mg, Ca <sup>+</sup> & ABG, cyclosporine or tacrolimus level at 6am CBC, renal panel, Glu, Ca <sup>+</sup> bid Echocardiogram	CXR in a.m. Labs: CBC/diff, renal panel, Glu, Mg, Ca <sup>+</sup> , cyclosporine or tacrolimus level at 6am
<b>Medications/ IV therapy</b>	Immunosuppression: Cyclosporine or tacrolimus, Methylprednisolone taper, Azathioprine D/C Dopamine, Milrinone +/- nicardipine and/or amlodipine for HTN (G25[B]). Acyclovir or ganciclovir (G17[A]), nystatin Furosemide, ranitidine, Maalox® Morphine, midazolam Acetaminophen	Immunosuppression: Cyclosporine or tacrolimus, Methylprednisolone taper, Azathioprine D/C Milrinone +/- nicardipine and/or amlodipine (G25[B]) Acyclovir or ganciclovir (G17[A]), nystatin Furosemide, Ranitidine, Maalox® Morphine, midazolam Acetaminophen	Immunosuppression: Cyclosporine or tacrolimus, Methylprednisolone taper, Azathioprine. +/- amlodipine (G25[B]) Acyclovir or ganciclovir (G17[A]), nystatin Furosemide, Ranitidine, Maalox® Acetaminophen
<b>Treatments/ Procedures</b>	CVP/RA line. A-line Dressing change/incision ✓ CPT prn, incentive spirometry (G12[B]) D/C chest tube	CVP/RA line. A-line Dressing check. CPT prn, incentive spirometry (G12[B]) Echocardiogram	CVP/RA line, D/C A-line Incision check CPT prn, incentive spirometry (G12[B]) Bandaid on CT site 48 hr. post chest tube removal.
<b>Nutrition</b>	Regular diet.	Regular diet. weight	Regular diet. weight
<b>Activity</b>	Protective isolation. Bedrest	Protective isolation. Ad lib	Protective isolation. Ad lib.
<b>Consults/referrals</b>			(Home Care)
<b>Psychosocial/Comfort</b>	Patient comfort measures. Family/patient support.	Patient comfort measures. Family/patient support.	Patient comfort measures. Family/patient support.
<b>Education</b>	Per Health Care Topic – “Going Home After Cardiac Surgery” and Transplant Patient/Family Manual	Per Health Care Topic – “Going Home After Cardiac Surgery” and Transplant Patient/Family Manual	Per Health Care Topic – “Going Home After Cardiac Surgery” and Transplant Patient/Family Manual
<b>Discharge planning</b>			Assess transfer readiness.

[ ] Indicates strongest strength of evidence (see guideline for evidence scale)



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**EXPECTED OUTCOMES**

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Signatures/ Credentials															
Timeline	Post-op day #2				Post-op day #3				Post-op day #4						
Unit/Dept.	CICU				CICU				CICU						
Date		D	E	N		D	E	N		D	E	N			
<b>Physiologic</b>	Hemodynamic stability. Normal respiratory function Diet tolerated. No signs of infection.					Hemodynamic stability. Normal respiratory function. Regular diet tolerated. No signs of infection. No signs of rejection.					Hemodynamic stability. Normal respiratory function. Regular diet tolerated. No signs of infection. Incision healing.				
<b>Psychosocial</b>	Family/patient informed. Increased patient activity with adequate pain control.					Family/patient informed. Increased patient activity with adequate pain control.					Family/patient informed. Increased patient activity with adequate pain control.				
<b>Educational</b>	Family has received Transplant Patient/Family Manual Family/patient teaching in progress.					Family has received Transplant Patient/Family Manual Family/patient teaching in progress.					Family has received Transplant Patient/Family Manual Family/patient teaching in progress.				
<b>Other</b>															
<b>Outcome not met due to:</b>	Hypertension Arrhythmia/Bradycardia Vomiting Fever Signs of infection. Persistent chest tube drng. Inadequate pain control.  Other: _____					Hypertension Bradycardia/ Paced Fever Signs of infection Unable to tolerate po feeding Signs of rejection Inadequate pain control.  Other: _____					Hypertension Bradycardia/ Paced Fever Signs of infection Unable to tolerate po feeding Inadequate pain control.  Other: _____				

**For each met outcome, initial = met**  
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**Expected length of stay: 10-14 days**

**Attending physician \_\_\_\_\_**

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Eligibility Criteria - Terminal heart disease, no active infection	
<b>Timeline</b>	Post-op Day # _____ to Transfer
<b>Unit/Dept.</b>	CICU
<b>Date</b> Transfer	
<b>Assessment/Monitoring</b>	Vital signs per routine
Cardiac	Cardiac monitor, CVP/RA, discontinue A-line
Resp/Pulm.	Assess breath sounds, O <sub>2</sub> sat
Fluid status	Measure I & O
Diagnostics	CBC/diff, platelet count, renal panel, magnesium every other day <input type="checkbox"/> cyclosporine level or <input type="checkbox"/> tacrolimus level Cardiac echo post-day 7 Endomyocardial biopsy pre-discharge (post-op day 10-14)
Medications/ IV therapy	Immunosuppression per protocol: tacrolimus <input type="checkbox"/> cyclosporine <input type="checkbox"/> Prednisone, Azathioprine <input type="checkbox"/> or Mycophenolate mofetil <input type="checkbox"/> Nystatin, Intravenous Ganciclovir (G17[A]) if CMV mismatch or Acyclovir, Bactrim® (G15[B]) Amlodipine (G25[B]), Furosemide, Ranitidine, Baby ASA Pain meds prn
Treatments/ Procedures	Incision check CPT prn, incentive spirometry (G12[B]) Routine C-line/PICC site care
Nutrition/GI	Regular for age Daily weight
Activity	Protective isolation Ad lib with mask if outside room Out of bed TID+
Consults/referrals	Home health care Child Life
Psychosocial	Patient comfort measures Family/Patient support
Education	Per Health Care Topic and Patient/Family Transplant Manual, Home Health Care, Transplant Coordinator -Medications, immunosuppression precautions, blood pressure monitoring, feeding/nutrition, rejection, infection, when to call
Discharge planning	Assess transfer readiness. Order home blood pressure equipment.

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**Clinical Pathway: Cardiac Transplant**  
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**EXPECTED OUTCOMES**

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Signatures/ Credentials													
Timeline	Post op Day # _____ to transfer	Post-op Day ____	Post-op Day ____	Post-op Day ____	Post-op Day ____	Post-op Day ____							
Unit/Dept.	CICU → Telemetry (A6C)												
Date		<b>D</b>	<b>E</b>	<b>N</b>	<b>D</b>	<b>E</b>	<b>N</b>	<b>D</b>	<b>E</b>	<b>N</b>	<b>D</b>	<b>E</b>	<b>N</b>
<b>Physiologic</b>	Hemodynamic stability. Adequate heart rate. (Pacer off ** _____ date) Blood pressure controlled. (Drips off ** _____ date) Stable respiratory status. No evidence of infection. Chest tubes removed _____ (date) without complication** No evidence of rejection. Good ventricular function by echo** _____ (date)												
<b>Psychosocial/ Comfort</b>	Family/patient informed. Pain controlled.												
<b>Educational</b>	Teaching (date initiated) Immunosuppression precautions/Isolation _____ (date) Immunosuppression Medications _____ (date) Blood pressure monitoring _____ (date) Feeding/Nutrition _____ (date) Rejection _____ (date) Infection _____ (date)												
<b>Other</b>	Transfer from ICU _____ (date)												
<b>Outcome not met due to:</b>	Unstable vital signs. <input type="checkbox"/> Bradycardia <input type="checkbox"/> Inadequate blood pressure control. <input type="checkbox"/> Respiratory distress. <input type="checkbox"/> Fever, signs of infection _____ Persistent drainage. <input type="checkbox"/> Signs of rejection – decreased ventricular function <input type="checkbox"/> Parent unavailable <input type="checkbox"/> Delay in ICU transfer due to _____												

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**Expected length of stay: 10-14 days**

**Attending physician \_\_\_\_\_**

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Eligibility Criteria - Terminal heart disease, no active infection	
<b>Timeline</b>	Post-op Day # _____ to Discharge
<b>Unit/Dept.</b>	Telemetry (A6C)
<b>Date</b> Transfer	
<b>Assessment/Monitoring</b>	Vital signs with BP per routine
Cardiac	Telemetry
Resp/Pulm.	Assess breath sounds.
Fluid status	Measure I & O
<b>Diagnostics</b>	CBC/diff, platelet count, renal panel, magnesium every other day <input type="checkbox"/> cyclosporine level or <input type="checkbox"/> tacrolimus level daily Cardiac echo pre-discharge Endomyocardial biopsy pre-discharge (post-op day 10-14)
<b>Medications/ IV therapy</b>	Immunosuppression per protocol: <input type="checkbox"/> tacrolimus, <input type="checkbox"/> cyclosporine Prednisone, Azathioprine <input type="checkbox"/> or Mycophenolate mofetil <input type="checkbox"/> Nystatin, Ganciclovir (G17[A]), Acyclovir, Bactrim® (G15[B]) Amlodipine (G25[B]), Furosemide, Ranitidine, Baby ASA Pain meds prn
<b>Treatments/ Procedures</b>	Incision check CPT prn, incentive spirometry (G12[B]) Routine C-line/PICC site care
<b>Nutrition/GI</b>	Regular for age Daily weight
<b>Activity</b>	Protective isolation Ad lib with mask if outside room Out of bed at least 3 times/day
<b>Consults/referrals</b>	Home health care Child Life
<b>Psychosocial</b>	Patient comfort measures Family/Patient support
<b>Education</b>	Per Health Care Topic and Patient/Family Transplant Manual, Home Health Care, Transplant Coordinator -Medications, immunosuppression precautions, blood pressure monitoring, feeding/nutrition, rejection, infection, when to call
<b>Discharge planning</b>	Assess discharge readiness. Order discharge prescriptions, home blood pressure equipment. Follow-up appointments made. Fax discharge communication to referring physician.

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**EXPECTED OUTCOMES**

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<b>Signatures/ Credentials</b>																	
<b>Timeline</b>	Post op Day # _____ to discharge	Post-op Day ___	Post-op Day ___	Post-op Day ___	Post-op Day ___	Post-op Day ___											
<b>Unit/Dept.</b>	Telemetry (A6C)																
<b>Date</b>		<b>D</b>	<b>E</b>	<b>N</b>	<b>D</b>	<b>E</b>	<b>N</b>	<b>D</b>	<b>E</b>	<b>N</b>	<b>D</b>	<b>E</b>	<b>N</b>	<b>D</b>	<b>E</b>	<b>N</b>	
<b>Physiologic</b>	Hemodynamic stability. Blood pressure controlled Stable respiratory status. No fevers, evidence of infection. Adequate cyclosporine <input type="checkbox"/> / tacrolimus <input type="checkbox"/> level ** No evidence of rejection. Good ventricular function by echo ** _____ (date) , biopsy ** _____ (date)																
<b>Psychosocial/ Comfort</b>	Family/patient informed regarding discharge needs. Increased patient activity with adequate pain control.																
<b>Educational</b>	Family/patient demonstrates comprehension of discharge instructions. Medications _____ (date) Immunosuppression precautions/Isolation _____ (date) Blood pressure monitoring _____ (date) Feeding/Nutrition _____ (date) Infection _____ (date) Rejection _____ (date) Prescriptions filled ** _____ (date) Follow-up appointments made ** _____ (date)																
<b>Other</b>	Patient is discharged to home <input type="checkbox"/> Ronald McDonald House <input type="checkbox"/> Discharge date _____																
<b>Outcome not met due to:</b>	Unstable vital signs. <input type="checkbox"/> Bradycardia <input type="checkbox"/> Hypertension <input type="checkbox"/> Respiratory distress. <input type="checkbox"/> Fever, signs of infection _____ Signs of rejection – decreased ventricular function <input type="checkbox"/> Family unable to assume home care due to _____ Delay in discharge due to: Other: _____																

**For each met outcome, initial = met    \* = not met (see progress notes)    \*\* APN will document**