Pneumonectomy Clinical Pathway

Site Applicability

Vancouver General Hospital (VGH)

Pathway Patient Goals

Inclusion Criteria

- Pneumonectomy

Exclusion Criteria

- Lobectomy, wedge resection, segmentectomy, bullectomy, decortication, sternotomy

Home Discharge Criteria

Instructions

1. Review pathway once per shift for patient care goals and expected outcomes
2. Do not document on this pathway, complete documentation in the Electronic Health Record (Cerner) or paper chart as per policy

Pre-Operative (admit prior) / Chest Centre	
Category / Focus / Care	**Desired Outcomes**
Discharge Planning/Teaching • Pamphlet: Welcome to Chest Centre • Pamphlet: Chest Surgery • Pamphlet: Going Home after Chest Surgery • Pamphlet: Pain Control After Surgery – Patient Information • Pamphlet: Epidural Analgesia – Patient Information • Pamphlet: Patient Controlled Analgesia – Patient Information • Pamphlet: Your safety while in hospital • Pamphlet: ICOUGH • Pamphlet: Lowering your risk for a Surgical Infection (pre-operative cleansing wipes) • Smoking Cessation • Discuss expected length of stay 5-7 days • As per patient history, identify issues that may affect discharge and follow up as appropriate (SW/CML)	• **Understands pre-op care & usual post-op course, plan for pain management, and measures to prevent post-op complications – per patient education pamphlet** • **Understands usual length of stay and expected discharge time of 10 am** • **Appropriate discharge plan in place, if not, social work/CML has been consulted**
Tests • CBC with automated differential and platelet count • Electrolytes, urea, creatinine, calcium, alkaline phosphatase, total and direct bilirubin, total protein, albumin, pre-albumin, aspartate transaminase (AST), lactate dehydrogenase (LDH) • INR, PTT • ABGs on room air • Group and Screen • Electrocardiogram • Chest X-ray PA and Lateral	• **Blood work and CXR completed and acceptable for surgery**
Treatments/ Assessments • Patient Admission Assessment completed • Systems assessment and VS Q shifts • Anesthesia consult • Medication Reconciliation completed • Pre-operative cleansing wipes at HS and in am	• **Pre-operative baseline assessment completed and acceptable for surgery**
Activity/Rest and/or ADLs • Activity as tolerated	• **Adequate sleep/rest**
Nutrition • DAT until midnight; no food after midnight may drink clear fluids after midnight until 3 hours pre op • Carbohydrate loading at HS (500 ml of clear juice) e.g. apple juice • Carbohydrate loading in am – 3 hours pre-op (250 ml of clear juice) e.g. apple juice	• **Adequate hydration and CHO intake preoperative**

OR Day / PACU	
Category / Focus / Care	**Desired Outcomes**
Discharge Planning/Teaching • Reinforce post-op care plan • Surgeon communicates with family post-op	• **Understands usual events / expectations of operative day** • **Understands usual post-op course, plan for pain management, and measures to prevent post-op complications – per patient education pamphlets**
Tests to be done POD 0 at HS • CBC, electrolytes, creatinine, blood glucose HS and in am • ABGs tonight and in am from arterial line only • Chest X-ray HS and in am	• **Blood work and CXR completed and acceptable**
Treatments/ Assessments • VS, assessment, and treatment as per PACU standards of care • Strict Intake and output • Fluid restrictions • O2 to keep SaO2 >92% (2-4 Lpm required with epidural x 48 hrs if patient is not ambulating) • Chest Tube clamped • Chest Tube removed IN PACU (physician to remove) • ECG Monitor (Telemetry) • Note if arterial line, CVC, and/or peripheral IV maintenance	• **Alert and oriented as pre-op, no delirium** • **Vital signs within expected parameters** • **SpO2 within normal limits of titration protocol** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **No evidence of progressive subcutaneous emphysema** • **No evidence of mediastinal shift** • **Incision dressings dry & intact** • **No evidence of cardiac pain** • **No evidence of new myocardial ischemia/infarction** • **No dysrhythmia requiring intervention** • **IV patent and site free from pain, redness swelling or discharge**
Activity/Rest and/or ADLs • DB & C, incentive spirometry (3 breaths) Q30min while awake • HOB minimum 30° at all times • Lie on **operative side only** • Bedrest • ROM and leg exercises Q4H while awake • Mouth care TID	• **Adequate sleep/rest** • **Performs ADL's with assistance** • **Effective deep breathing and coughing**
Pain • Epidural protocol • PCA protocol	• **Adequate pain control, pain (<4/10) is not interfering with mobilization and DB & C** • **Sedation score less than 3 and/or respiratory rate greater than 8/min** • **Epidural catheter intact, with dressing dry and intact**
Nutrition • NPO	• **No nausea or vomiting**
Elimination • Foley catheter to straight drainage • Catheter care BID	• **Urine output greater than 0.5-1.0 ml/kg/hr**

Post-Op Day 1	
Category / Focus / Care	**Desired Outcomes**
Discharge Planning/Teaching • Transfer to ward when PACU discharge criteria met • Assess for issues affecting discharge and follow-up as appropriate • Ensure patient has all required teaching booklets, reinforce post op care plan	• **Patient understands usual post-op course, plan for pain management, and measures to prevent post-op complications – per patient education pamphlets** • **Appropriate discharge plan in place, if not, social work/CML has been consulted** • **Patient and family prepared for anticipated discharge date**
Tests to be done POD 1 in am • CBC, electrolytes, creatinine, blood glucose in am • ABGs in am from arterial line only • Chest X-ray in am	• **Blood work and CXR completed and acceptable**
Treatments/ Assessments • Vital signs Q4H and PRN (as per POPS protocol) • Systems assessment Q6H and PRN • Strict Intake and output • Fluid restrictions • O2 to keep SaO2 >92% (2-4 Lpm required with epidural x 48 hrs if patient is not ambulating) • ECG Monitor (Telemetry) • Observe surgical incision dressings Q shift • Note if arterial line, CVC, and/or peripheral IV maintenance	• **Alert and oriented as pre-op, no delirium** • **Vital signs within expected parameters** • **SpO2 within normal limits of titration protocol** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **No evidence of progressive subcutaneous emphysema** • **No evidence of mediastinal shift** • **Incision dressings dry & intact** • **No evidence of cardiac pain** • **No evidence of new myocardial ischemia/infarction** • **No dysrhythmia requiring intervention** • **IV patent and site free from pain, redness swelling or discharge**
Activity/Rest and/or ADLs • DB & C, incentive spirometry (3 breaths) Q30min while awake • HOB minimum 30° at all times • Lie on **operative side only** • Chair TID (for meals) • ROM and leg exercises Q4H while awake • Mouth care TID	• **Adequate sleep/rest** • **Performs ADL's with minimal assistance, demonstrates progressive activity** • **Effective deep breathing and coughing**
Pain • Epidural protocol • PCA protocol • Assess readiness to wean epidural/PCA • Start PO analgesia when tolerating oral diet	• **Adequate pain control, pain (<4/10) is not interfering with mobilization and DB & C** • **Sedation score less than 3 and/or Respiratory Rate greater than 8/min** • **Epidural catheter intact, with dressing dry and intact**
Nutrition • DAT	• **Patient tolerating prescribed diet** • **No nausea or vomiting**
Elimination • Foley catheter to straight drainage • Catheter care/peri care BID • Bowel protocol PRN	• **Urine output greater than 0.5-1.0 ml/kg/hr**

Post-Op Day 2	
Category / Focus / Care	**Desired Outcomes**
Discharge Planning/Teaching • Assess for issues affecting discharge and follow-up as appropriate • Ensure patient has all required teaching booklets, reinforce post op care plan • Review discharge plan and confirm date with CML	• **Patient understands usual post-op course, plan for pain management, and measures to prevent post-op complications – per patient education pamphlets** • **Patient & family understand discharge instructions per pamphlets and follow up plan/appointments** • **Appropriate discharge plan in place, if not, social work/CML has been consulted** • **Patient and family prepared for anticipated discharge date**
Treatments/ Assessments • Vital signs Q4H and PRN (as per POPS protocol) • Systems assessment Q6H and PRN • Strict Intake and output • Fluid restrictions • O2 to keep SaO2 >92% (**2-4 Lpm required with epidural x 48 hrs if patient is not ambulating)** • ECG Monitor (Telemetry) • Remove incision dressings • Discontinue arterial line • Discontinue CVC • Saline lock IV if tolerating fluids	• **Alert and oriented as pre-op, no delirium** • **Vital signs within expected parameters** • **SpO2 within normal limits of titration protocol** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **No evidence of progressive subcutaneous emphysema** • **No evidence of mediastinal shift** • **Incisions dry and intact, wound edges approximated** • **No evidence of cardiac pain** • **No evidence of new myocardial ischemia/infarction** • **No dysrhythmia requiring intervention** • **Peripheral IV patent and site free from pain, redness swelling or discharge.**
Activity/Rest and/or ADLs • DB & C, incentive spirometry (3 breaths) Q30min while awake • HOB minimum 30^{o} at all times • Lie on **operative side only** • Chair TID (for meals) • Ambulate with assistance x 2 as tolerated • Mouth care TID	• **Adequate sleep/rest** • **Performs ADL's with minimal assistance, demonstrates progressive activity** • **Effective deep breathing and coughing**
Pain • Epidural protocol • PCA protocol • Assess readiness to wean epidural/PCA • Start PO analgesia when tolerating oral diet	• **Adequate pain control, pain (<4/10) is not interfering with mobilization and DB & C** • **Sedation score less than 3 and/or Respiratory Rate greater than 8/min** • **Epidural catheter intact, with dressing dry and intact**
Nutrition • DAT	• **Patient tolerating prescribed diet** • **No nausea or vomiting**
Elimination • Foley catheter to straight drainage • Catheter care/peri care BID • Bowel protocol PRN	• **Urine output greater than 0.5-1.0 ml/kg/hr** • **Patient has had BM since surgery**

Post-Op Day 3	
Category / Focus / Care	**Desired Outcomes**
Discharge Planning/Teaching • Assess for issues affecting discharge and follow-up as appropriate • Ensure patient has all required teaching booklets, reinforce post op care plan • Review discharge plan and confirm date with CML	• **Patient understands usual post-op course, plan for pain management, and measures to prevent post-op complications – per patient education pamphlets** • **Patient & family understand discharge instructions per pamphlets and follow up plan/appointments** • **Appropriate discharge plan in place, if not, social work/CML has been consulted** • **Patient and family prepared for anticipated discharge date**
Tests • AM bloodwork: CBC, electrolytes, Creatinine	• **Blood work and CXR completed and acceptable**
Treatments/ Assessments • Vital signs Q6H and PRN (as per POPS protocol) • Systems assessment Q12H and PRN • Intake and output • Fluid restrictions • O2 to keep SaO2 >92% • Surgical incisions open to air • ECG Monitor (Telemetry) • Saline lock maintenance	• **Alert and oriented as pre-op, no delirium** • **Vital signs within expected parameters** • **SpO2 within normal limits of titration protocol** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **No evidence of progressive subcutaneous emphysema** • **No evidence of mediastinal shift** • **Incisions dry and intact, wound edges approximated** • **No evidence of cardiac pain** • **No evidence of new myocardial ischemia/infarction** • **No dysrhythmia requiring intervention** • **Peripheral IV patent and site free from pain, redness swelling or discharge.**
Activity/Rest and/or ADLs • DB & C, incentive spirometry (3 breaths) Q30min while awake • HOB minimum 30° at all times • Lie on **operative side only** • Chair TID (for meals) • Ambulate independently TID • Mouth care TID	• **Adequate sleep/rest** • **Performs ADL's with minimal assistance, demonstrates progressive activity** • **Effective deep breathing and coughing**
Pain • Epidural protocol • PCA protocol • Assess readiness to wean epidural/PCA • Start PO analgesia when tolerating oral diet	• **Adequate pain control, pain (<4/10) is not interfering with mobilization and DB & C** • **Sedation score less than 3 and/or Respiratory Rate greater than 8/min** • **Epidural catheter intact, with dressing dry and intact**
Nutrition • DAT	• **Patient tolerating prescribed diet**
Elimination • Bowel protocol PRN	• **Urine output greater than 0.5-1.0 ml/kg/hr** • **Patient has had BM since surgery**

Post-Op Day 4	
Category / Focus / Care	**Desired Outcomes**
Discharge Planning/Teaching • Assess for issues affecting discharge and follow-up as appropriate • Ensure patient has all required teaching booklets, reinforce post op care plan • Review discharge plan and confirm date with CML	• **Patient understands usual post-op course, plan for pain management, and measures to prevent post-op complications – per patient education pamphlets** • **Patient & family understand discharge instructions per pamphlets and follow up plan/appointments** • **Appropriate discharge plan in place, if not, social work/CML has been consulted** • **Patient and family prepared for anticipated discharge date**
Treatments/ Assessments • Vital signs Q12H and PRN • Systems assessment Q12H and PRN • Intake and output • Fluid restrictions • O2 to keep SaO2 >92% • Surgical incisions open to air • ECG Monitor (Telemetry) • Saline lock maintenance	• **Alert and oriented as pre-op, no delirium** • **Vital signs within expected parameters** • **SpO2 within normal limits of titration protocol** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **No evidence of progressive subcutaneous emphysema** • **No evidence of mediastinal shift** • **Incisions dry and intact, wound edges approximated** • **No evidence of cardiac pain** • **No evidence of new myocardial ischemia/infarction** • **No dysrhythmia requiring intervention** • **Peripheral IV patent and site free from pain, redness swelling or discharge.**
Activity/Rest and/or ADLs • DB & C, incentive spirometry (3 breaths) Q30min while awake • HOB minimum 30^{o} at all times • Lie on **operative side only** • Chair TID (for meals) • Ambulate independently > 5 times per day • Mouth care TID	• **Adequate sleep/rest** • **Performs ADL's with minimal assistance, demonstrates progressive activity** • **Effective deep breathing and coughing**
Pain • PO analgesia	• **Adequate pain control, pain (<4/10) is not interfering with mobilization and DB & C** • **Sedation score less than 3 and/or Respiratory Rate greater than 8/min**
Nutrition • DAT	• **Patient tolerating prescribed diet**
Elimination • Bowel protocol PRN	• **Urine output greater than 0.5-1.0 ml/kg/hr** • **Patient has had BM since surgery**

Post-Op Day 5	
Category / Focus / Care	**Desired Outcomes**
Discharge Planning/Teaching • Assess for issues affecting discharge and follow-up as appropriate • Ensure patient has all required teaching booklets, reinforce post op care plan • Review discharge plan and confirm date with CML • Dalteparin Teaching (if indicated)	• **Patient understands usual post-op course, plan for pain management, and measures to prevent post-op complications – per patient education pamphlets** • **Patient & family understand discharge instructions per pamphlets and follow up plan/appointments** • **Appropriate discharge plan in place, if not, social work/CML has been consulted** • **Patient and family prepared for anticipated discharge date**
Treatments/ Assessments • Vital signs Q12H and PRN • Systems assessment Q12H and PRN • O2 to keep SaO2 >92% • Chest incisions open to air • Discontinue ECG Monitor (Telemetry) • Discontinue saline lock if patient tolerating oral fluids	• **Alert and oriented as pre-op, no delirium** • **Vital signs within expected parameters** • **SpO2 within normal limits of titration protocol** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **No evidence of progressive subcutaneous emphysema** • **No evidence of mediastinal shift** • **Incisions dry and intact, wound edges approximated**
Activity/Rest and/or ADLs • DB & C, incentive spirometry (3 breaths) Q30min while awake • HOB minimum 30° at all times • Lie on **operative side only** • Chair TID (for meals) • Ambulate independently > 5 times per day • Mouth care TID	• **Adequate sleep/rest** • **Performs ADL's with minimal assistance, demonstrates progressive activity** • **Effective deep breathing and coughing**
Pain • PO analgesia	• **Adequate pain control, pain (<4/10) is not interfering with mobilization and DB & C** • **Sedation score less than 3 and/or Respiratory Rate greater than 8/min**
Nutrition • DAT	• **Patient tolerating prescribed diet**
Elimination • Bowel protocol PRN	• **Urine output greater than 0.5-1.0 ml/kg/hr** • **Patient has had BM since surgery**

Post-Op Day 6	
Category / Focus / Care	**Desired Outcomes**
Discharge Planning/Teaching • Assess for issues affecting discharge and follow-up as appropriate • Ensure patient has all required teaching booklets, reinforce post op care plan • Review discharge plan and confirm date with CML • Dalteparin Teaching (if indicated)	• **Patient understands usual post-op course, plan for pain management, and measures to prevent post-op complications – per patient education pamphlets** • **Patient & family understand discharge instructions per pamphlets and follow up plan/appointments** • **Appropriate discharge plan in place, if not, social work/CML has been consulted** • **Patient and family prepared for anticipated discharge date**
Treatments/ Assessments • Vital signs Q12H and PRN • Systems assessment Q12H and PRN • O2 to keep SaO2 >92% • Chest incisions open to air	• **Alert and oriented as pre-op, no delirium** • **Vital signs within expected parameters** • **SpO2 within normal limits of titration protocol** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **No evidence of progressive subcutaneous emphysema** • **No evidence of mediastinal shift** • **Incisions dry and intact, wound edges approximated**
Activity/Rest and/or ADLs • DB & C, incentive spirometry (3 breaths) Q30min while awake • HOB minimum 30° at all times • Lie on **operative side only** • Chair TID (for meals) • Ambulate independently > 5 times per day • Mouth care TID	• **Adequate sleep/rest** • **Performs ADL's with minimal assistance, demonstrates progressive activity** • **Effective deep breathing and coughing**
Pain • PO analgesia	• **Adequate pain control, pain (<4/10) is not interfering with mobilization and DB & C** • **Sedation score less than 3 and/or Respiratory Rate greater than 8/min**
Nutrition • DAT	• **Patient tolerating prescribed diet**
Elimination • Bowel protocol PRN	• **Urine output greater than 0.5-1.0 ml/kg/hr** • **Patient has had BM since surgery**

Post-Op Day 7	
Category / Focus / Care	**Desired Outcomes**
Discharge Planning/Teaching • Assess for issues affecting discharge and follow-up as appropriate • Ensure patient has all required teaching booklets, reinforce post op care plan • Review discharge plan and confirm date with CML • Dalteparin Teaching (if indicated) • Discharged – patient meets discharge criteria	• **Patient understands usual post-op course, plan for pain management, and measures to prevent post-op complications – per patient education pamphlets** • **Patient & family understand discharge instructions per pamphlets and follow up plan/appointments** • **Patient and family prepared for anticipated discharge date**
Treatments/ Assessments • Vital signs Q12H and PRN • Systems assessment Q12H and PRN • O2 to keep SaO2 >92% • Chest incisions open to air	• **Alert and oriented as pre-op, no delirium** • **Vital signs within expected parameters** • **SpO2 within normal limits of titration protocol** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **No evidence of progressive subcutaneous emphysema** • **No evidence of mediastinal shift** • **Incisions dry and intact, wound edges approximated**
Activity/Rest and/or ADLs • DB & C, incentive spirometry (3 breaths) Q30min while awake • HOB minimum 30° at all times • Lie on **operative side only** • Chair TID (for meals) • Ambulate independently > 5 times per day • Mouth care TID	• **Adequate sleep/rest** • **Performs ADL's with minimal assistance, demonstrates progressive activity** • **Effective deep breathing and coughing**
Pain • PO analgesia	• **Adequate pain control, pain (<4/10) is not interfering with mobilization and DB & C** • **Sedation score less than 3 and/or Respiratory Rate greater than 8/min**
Nutrition • DAT	• **Patient tolerating prescribed diet**
Elimination • Bowel protocol PRN	• **Urine output greater than 0.5-1.0 ml/kg/hr** • **Patient has had BM since surgery**

Discharge Criteria (must be completed on discharge)
• Pamphlet: Going Home after Chest Surgery • Dalteparin teaching completed if indicated • Prescription(s) and Discharge Medication Reconciliation form given to patient and new medications reviewed with patient • Patient instructed on pain management strategies and how to wean from pain medicines at home • Patient instructed on bowel management while taking opioids • Staple remover given to patient and instructed when to go to GP to have staples removed • My Discharge Plan given to patient • Required home supports requested • ADLs performed to an acceptable level (close to baseline) prior to discharge • Chest incision well approximated, free of redness and drainage, steri-strips removed

Developed By

Effective Date:	
Posted Date:	
Last Revised:	
Last Reviewed:	
Approved By:	
	Endorsed By: **Final Sign Off:**
Owners:	VCH
	Developer Lead(s): • Patient Care Coordinator, Chest Centre T12 & LB8D, VGH