Thoracic Surgery (Thoracotomy or VATS) Clinical Pathway

Site Applicability

Vancouver General Hospital (VGH)

Pathway Patient Goals

Inclusion Criteria

Lobectomy, Wedge resection, Segmentectomy, Decortication, Bullectomy, Sleeve resection and 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: Sternal Incision Protection • Pamphlet: Home Exercise After Sternotomy • 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 3-5 days VATS, 5-7 days THORACOTOMY • 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, alkaline phosphatase, aspartate transaminase (AST), lactate dehydrogenase (LDH), total and direct bilirubin, albumin, urea, creatinine • 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 • 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 / Chest Centre (Post-op Day 0)	
Category / Focus / Care	**Desired Outcomes**
Discharge Planning/Teaching • Reinforce post-op care plan • Surgeon communicates with family post-op • Transfer to ward when PACU discharge criteria met	• **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, urea, creatinine, blood glucose • ABGs (when arterial line in situ) • Chest X-ray	• **Blood work and CXR completed and acceptable**
Treatments/ Assessments • VS, assessment, and treatment as per PACU standards of care • Vital signs q 1 h and PRN (as per POPS protocol) • Systems assessment q 4 h and PRN • Intake and output Q6H • O2 to keep SaO2 >92% (2-4 Lpm required with epidural x 48 hrs if patient is not ambulating) • Chest Tube (CT) to -20cm suction, monitor drainage/system q 1 h, record chest drainage q 6 h • ECG Monitor (Telemetry) • Note if arterial line, CVC, and/or peripheral IV/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** • **Chest tube drainage less than 100 ml/hr x 3 consecutive hours** • **Minimal to NO air leak from CT** • **No evidence of progressive subcutaneous emphysema** • **CT site dressing dry, intact and occlusive** • **No evidence of cardiac pain** • **No dysrhythmia requiring intervention** • **No evidence of new myocardial ischemia/infarction** • **Incision dressings dry and intact** • **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 • Dangle at HS/Activity as tolerated • Mouthcare TID • Sternotomy precautions	• **Adequate sleep/rest** • **Performs ADL's with assistance** • **Effective deep breathing and coughing** • **Mobilizes following sternotomy precautions (if applicable)**
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 • Full fluids as tolerated post-op	• **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 • 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, urea, creatinine, blood glucose • ABGs (when arterial line in situ) • Chest X-ray	• **Blood work and CXR completed and acceptable**
Treatments/ Assessments • Vital signs Q4H and PRN (as per POPS protocol) • Systems assessment Q6H and PRN • Intake and output Q6H • O2 to keep SaO2 >92% (2-4 Lpm required with epidural x 48 hrs if patient is not ambulating) • Maintain chest tube suction as ordered • Monitor chest drainage/system q 1 h, record chest drainage q 6 h • ECG Monitor (Telemetry) • Change chest tube dressing on POD 1 • D/C CVC / Arterial line • peripheral IV/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** • **Chest tube drainage less than 100 mls /hr x 3 consecutive hours** • **Minimal or No air leak** • **No evidence of progressive subcutaneous emphysema** • **Chest tube site dressing dry and intact** • **No evidence of cardiac pain or evidence of new myocardial ischemia/infarction** • **No dysrthymias requiring intervention** • **Incision dressings dry and intact** • **IV patent and site free from pain, redness or swelling**
Activity/Rest and/or ADLs • DB & C, incentive spirometry (3 breaths) Q30min while awake • HOB minimum 30° at all times • Chair TID (for meals) and walking in hall • Mouth care TID • Exercises as per discharge booklet • Sternotomy precautions	• **Adequate sleep/rest** • **Performs ADL's with minimal assistance, demonstrates progressive activity** • **Demonstrates exercises as per discharge pamphlet** • **Mobilizes following sternotomy precautions (if applicable)**
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** • **Mobilizes following sternotomy precautions (if applicable)**
Nutrition • DAT	• **Patient tolerating prescribed diet** • **No nausea or vomiting**
Elimination • Remove Foley catheter • Catheter care/peri care BID • Bowel protocol PRN	• **Urine output greater than 0.5-1.0 ml/kg/hr** • **Bowel sounds present and passing flatus**

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 • Intake and output Q6H • O2 to keep SaO2 >92% (wean as tolerated) • Chest tube removal – physician ordered required • Maintain CT suction as per physician order • Monitor chest drainage/system q 1 h, record chest drainage q 6 h • Chest incision open to air • ECG Monitor (Telemetry) • Peripheral IV/saline lock maintenance	• **Alert and oriented as pre-op, no delirium** • **SpO2 within normal limits of titration protocol or on room air** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **Vital signs within expected parameters** • **Chest tube site drainage minimal or chest tube removed** • **Minimal or No air leak if chest tube present** • **No evidence of progressive subcutaneous emphysema** • **Chest tube dressing dry and intact (change q48h and prn)** • **No evidence of cardiac pain or evidence of new myocardial ischemia/infarction** • **No dysrthymias requiring intervention** • **Incisions dry and intact, wound edges approximated** • **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 • Mouth care TID • Exercises as per discharge booklet • Sternotomy precautions	• **Adequate sleep/rest** • **Performs ADL's with minimal assistance, demonstrates progressive activity** • **Demonstrates exercises as per discharge pamphlet** • **Mobilizes following sternotomy precautions (if applicable)**
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 • 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 • Discharged – patient meets discharge criteria on page 19	• **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**
Tests • CBC, electrolytes, urea, 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 Q6H • O2 to keep SaO2 >92% (wean as tolerated) • Chest tube removal – physician order required • Maintain CT suction as per physician order • Monitor chest drainage/system q 1 h, record chest drainage q 6 h • Chest incisions open to air • ECG Monitor (Telemetry) • D/C peripheral IV/saline lock if patient tolerating oral fluids and epidural and CT(s) have been removed	• **Alert and oriented as pre-op, no delirium** • **SpO2 within normal limits of titration protocol or on room air** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **Vital signs within expected parameters** • **Chest tube drainage minimal or chest tube removed** • **Minimal or No air leak if chest tube present** • **No evidence of progressive subcutaneous emphysema** • **Chest tube site dressing dry and intact** • **No evidence of cardiac pain or evidence of new myocardial ischemia/infarction** • **No dysrthymias requiring intervention** • **Incisions dry and intact, wound edges approximated** • **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 • Ambulating independently • Mouth care TID • Exercises as per discharge booklet • Sternotomy precautions	• **Adequate sleep/rest** • **Performs ADL's Independently** • **Demonstrates exercises as per discharge pamphlet** • **Mobilizes following sternotomy precautions (if applicable)**
Pain • Epidural protocol • PCA protocol • Assess readiness to wean epidural/PCA • 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** • **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 • Discharged – patient meets discharge criteria on page 19	• **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**
Treatments/ Assessments • Vital signs Q12H and PRN • Systems assessment Q12H and PRN • O2 to keep SaO2 >92% • Chest incisions open to air • ECG Monitor (Telemetry) • D/C peripheral IV/saline lock if patient tolerating oral fluids and epidural and CT(s) have been removed	• **Alert and oriented as pre-op, no delirium** • **SpO2 within normal limits of titration protocol or on room air** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **Vital signs within expected parameters** • **Chest tube site dressing dry and intact** • **No evidence of cardiac pain or evidence of new myocardial ischemia/infarction** • **No dysrythmias requiring intervention** • **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 • Ambulating independently • Mouth care TID • Exercises as per discharge booklet • Sternotomy precautions	• **Adequate sleep/rest** • **Performs ADL's Independently** • **Demonstrates exercises as per discharge pamphlet** • **Mobilizes following sternotomy precautions (if applicable)**
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 adequate** • **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 • Discharged – patient meets discharge criteria on page 19	• **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**
Treatments/ Assessments • Vital signs Q12H and PRN • Systems assessment Q12H and PRN • O2 to keep SaO2 >92% • Chest incisions open to air • ECG Monitor (Telemetry)	• **Alert and oriented as pre-op, no delirium** • **SpO2 within normal limits of titration protocol or on room air** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **Vital signs within expected parameters** • **No evidence of cardiac pain or evidence of new myocardial ischemia/infarction** • **No dysrythmias requiring intervention** • **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 • Ambulating independently • Mouth care TID • Exercises as per discharge booklet • Sternotomy precautions	• **Adequate sleep/rest** • **Performs ADL's Independently** • **Demonstrates exercises as per discharge pamphlet** • **Mobilizes following sternotomy precautions (if applicable)**
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 satisfactory** • **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 • Discharged – patient meets discharge criteria on page 19	• **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**
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** • **SpO2 within normal limits of titration protocol or on room air** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **Vital signs within expected parameters** • **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 • Ambulating independently • Mouth care TID • Exercises as per discharge booklet • Sternotomy precautions	• **Adequate sleep/rest** • **Performs ADL's Independently** • **Demonstrates exercises as per discharge pamphlet** • **Mobilizes following sternotomy precautions (if applicable)**
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 satisfactory** • **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 • Discharged – patient meets discharge criteria on page 19	• **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**
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** • **SpO2 within normal limits of titration protocol or on room air** • **Respiratory rate, rhythm and effort are stable** • **Breath sounds within expected parameters** • **Vital signs within expected parameters** • **Incisions dry and intact, wound edges approximated**
Activity/Rest and/or ADLs • DB & C, incentive spirometry (3 breaths) Q30min while awake • HOB minimum 30^{o} at all times • Ambulating independently • Mouth care TID • Exercises as per discharge booklet • Sternotomy precautions	• **Adequate sleep/rest** • **Performs ADL's Independently** • **Demonstrates exercises as per discharge pamphlet** • **Mobilizes following sternotomy precautions (if applicable)**
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 satisfactory** • **Patient has had BM since surgery**

Discharge Criteria (must be completed on discharge)
• Pamphlet: Going Home after Chest Surgery • Pamphlet: Home Exercises after Sternotomy • Pamphlet: Sternotomy Incision Protection • Prescription(s) and Discharge Medication Reconciliation form given to patient and new medications reviewed with patient • Dalteparin teaching completed if indicated • Patient instructed on pain management strategies and how to wean from pain medicines at home • Patient instructed on bowel management while taking opioids • Incision staples can be removed 5-7 days after surgery, If patient going home with staples give patient staple remover to have staples removed in GP office • CT site free of redness and drainage; patient knows when to have suture removed (suture can be removed 5 days after chest tube removal, if site healing) • Sterile scissors given to patient for chest tube suture removal, at GP office, if patient being discharged with CT site suture • MIS incisions free of redness and drainage • ADLs performed to an acceptable level (close to baseline) prior to discharge • Patient concerns regarding discharge discussed and documented in progress notes • My Discharge Plan given to patient

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