Lung Resection: Lobectomy, Segmentectomy, Wedge Resection

Background
Lung resection is the surgical removal of all or part of the lung due to lung cancer or other lung disease.

- Lobectomy
  - Removes one lobe of the lung
- Segmentectomy
  - Removes areas of the lung along with their veins, arteries, and airways
- Wedge resection
  - Removes an area of the lung that includes part of one or more lobes

Key Aspects of Care
- Expected length of stay is ≤ 5 days
- Remove epidural after removal of chest tube
- Remove Foley on the first day after surgery
- In general, apply telemetry only when cardiac history or cardiac event occurred in the OR
- Chest tubes:
  - Dressing changes every 48 hrs. or when saturated
  - Cover occlusive dressing at exit site with drain sponge, gauze dressing, and tape
  - Do not strip chest tubes
    - Milk tube if necessary

Notify Physician
Notify physician for the following:
- SBP > 180 mmHg or < 90 mmHg
- DBP > 100 mmHg or < 60 mmHg
- Heart rate > 110 bpm or < 60 bpm
- Respiratory rate > 24 breaths per minute or < 10 breaths per minute
- Temperature > 101.5°F
- Oxygen saturation less than 88% at rest, or increased oxygen requirement
- If patient is short of breath or oxygen saturation less than 88%, contact physician for order to obtain arterial blood gas
  - Call physician if pO2 is < 60% or if pCO2 is > 45 mmHg
- Chest tube output > 100 mL/hr
- Urine output < 30 mL/hr. or < 240 mL/8hrs

Labs and Imaging
Typical postoperative Lung Resection orders include the following laboratory and imaging tests:

<table>
<thead>
<tr>
<th>Test</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chest X-ray</td>
<td>Daily until chest tube is removed</td>
</tr>
<tr>
<td>CBC with differential</td>
<td>First two days</td>
</tr>
<tr>
<td>Chem 7</td>
<td>First two days</td>
</tr>
</tbody>
</table>

Nutrition
- Clear liquids if no nausea/vomiting and if fully alert
- Advance to regular / cardiac / ADA diet as tolerated and continue as appropriate

Activity
- Out of bed to chair 4 hrs. after arrival on floor
- On post-op day 1, out of bed to chair and ambulate in hallway around the unit TID
- On subsequent days, ambulate by self-ad lib around unit and down hallway, walking farther each day
- Sequential compression device (SCD) while in bed

Desired Patient Outcomes
- Patient verbalizes:
  - Understanding of pain scale
  - Understanding of importance of ambulation and pulmonary toileting
  - Expectations for optimal post-op recovery
- Good activity level is achieved, including ability to perform activities of daily living
- Pain is well controlled

Consults
- Acute Pain Team to manage epidural and pain issues
- Cardiology, as appropriate
- Diabetes CNS for newly diagnosed diabetic or poor glucose control
- Smoking cessation / nicotine dependency if patient is a smoker
- Palliative Care, as appropriate
- Pulmonary Rehab
Medications and IV Fluids

- Reconcile medications daily
- Typical postoperative Lung Resection orders include the following medications and IV fluids:

<table>
<thead>
<tr>
<th>Medication</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotic Prophylaxis</td>
<td>Antibiotic prophylaxis x 24 hrs. day of surgery – terminated next day</td>
</tr>
<tr>
<td>Pain Management</td>
<td>Epidural / PCA or oral medications as ordered. Epidural removed when chest tube removed</td>
</tr>
<tr>
<td>DVT Prophylaxis</td>
<td>Pharmacological and mechanical as ordered</td>
</tr>
<tr>
<td>Supportive Medications</td>
<td>As needed</td>
</tr>
<tr>
<td>Maintenance IV solutions</td>
<td>As ordered – convert to saline well when patient taking oral pain meds and food</td>
</tr>
<tr>
<td>GI Related</td>
<td>Stool softener / laxatives as needed</td>
</tr>
</tbody>
</table>

Care and Assessment

<table>
<thead>
<tr>
<th>Assessment</th>
<th>Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vital signs</td>
<td>Every 4 hrs.</td>
</tr>
<tr>
<td>Input and output</td>
<td>Every 4 hrs.</td>
</tr>
<tr>
<td>Pulse oximetry</td>
<td>Every 4 hrs. and PRN</td>
</tr>
<tr>
<td></td>
<td>If &gt; 88%, place patient on room air</td>
</tr>
<tr>
<td>Physical assessment</td>
<td>Every 4 hrs.</td>
</tr>
<tr>
<td>Weight</td>
<td>Every morning</td>
</tr>
<tr>
<td>Respiratory status</td>
<td>Every 4 hrs.</td>
</tr>
<tr>
<td>Cardiac monitoring</td>
<td>Every 4 hrs.</td>
</tr>
<tr>
<td>Pain assessment</td>
<td>Every 4 hrs.</td>
</tr>
<tr>
<td></td>
<td>When tolerating oral intake, remove PCA and give oral analgesics</td>
</tr>
<tr>
<td>Incentive spirometry (IS)</td>
<td>IS X 10 reps</td>
</tr>
<tr>
<td>Encourage coughing and deep breathing (CDB)</td>
<td>CDB every hour while awake</td>
</tr>
<tr>
<td></td>
<td>Patient sent home with IS</td>
</tr>
<tr>
<td>Oxygen</td>
<td>Maintain O₂ Sat &gt; 88% or increasing O₂ requirements</td>
</tr>
<tr>
<td></td>
<td>Wean to keep O₂ Sat &gt; 88%</td>
</tr>
<tr>
<td></td>
<td>If O₂ Sat &gt; 88%, remove oxygen</td>
</tr>
<tr>
<td></td>
<td>Patient sent home on room air or oxygen, if O₂ Sat &lt; 88%</td>
</tr>
</tbody>
</table>

Discharge Planning

- Coordinate discharge planning
- Enter planned discharge order
- Arrange home health care if indicated and if MINI Sahara in place
- Arrange home oxygen if indicated
- Provide emotional support to patient and family
- Discharge patient with home care needs/equipment in place, discharge instructions, and prescriptions

Patient Education

Provide information and explain the following items to the patient and family.

- Pain management
- Medications
- Care of chest tube site, chest tube, and valve – MINI Sahara care if indicated
- Wound care
- Pulmonary toileting – cough and deep breath; use of incentive spirometer
- Diabetes (if newly diagnosed diabetic or poorly controlled)
- When to call physician:
  - Temperature > 101°F
  - Increased cough or sputum production
  - Incision or chest tube site redness or warmth
  - Incision or chest tube site with discharge or is separating
  - Increased difficulty with breathing
  - Increased pain
  - Increased fatigue
Related Policies / Procedures

- OSUMC Patient Care Standards of Practice:
  - Chest Drainage System (Closed), Management of the patient with a (CCDS)
  - Pain and Symptom Management
  - Documentation of the Nursing Process
- Pharmacy and Therapeutics Policy and Procedure
  - Medication Administration - High Risk Medications

Order Set

- T/S: Post Op Lung Resection [2093]

Quality Measures

- Length of stay
- Mortality
- Readmission rate
- Transfer to a higher level of care
- Incidence of post-op complications

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Guideline Approved


Disclaimer: Clinical practice guidelines and algorithms at The Ohio State University Wexner Medical Center (OSUWMC) are standards that are intended to provide general guidance to clinicians. Patient choice and clinician judgment must remain central to the selection of diagnostic tests and therapy. OSUWMC's guidelines and algorithms are reviewed periodically for consistency with new evidence; however, new developments may not be represented.

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