## Potential Complications for Common Procedures

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Assessment</th>
<th>Potential Complications</th>
<th>Possible Interventions Needed</th>
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</thead>
</table>
| Thoracentesis             | Assess respiratory status including respiratory excursion, lung sounds, cough, or hemoptysis; and puncture site for bleeding or crepitus. | ● Pneumothorax  
● Bleeding – hemothorax, hemotoma, hemoperitoneum  
● SQ emphysema  
● Laceration of liver, spleen, or lung  
● Hypovolemia  
● Hypotension  
● Dyspnea  
● Re-expansion pulmonary edema | ● Apply a dressing over an open chest wound  
 ● Administer oxygen as prescribed.  
 ● Position the client in high fowler’s position.  
 ● Prepare for chest tube placement until the lung has expanded fully.  
 ● Monitor for signs of bleeding; check serial H&H; coags  
 ● Monitor vital signs and puncture site frequently.  
 ● For SQ Emphysema – while palpating the involved area, use a skin marker to identify its borders. |
| Chest Tube Insertion      | Assess respiratory status including respiratory rate, work of breathing, breath sounds, and O₂ sats.  
Inspect the dressing and note any drainage.  
Assess the insertion site for SQ emphysema and tube migration. | ● Malposition, Dislodgement, or Disconnection of chest tube  
● Pneumothorax  
● SQ emphysema  
● Excessive Blood in chest tube  
● Organ Injury (eg, lung, diaphragm, heart, liver, or spleen  
● Infection (eg, empyema, pneumonia)  
● Pain | ● If the chest tube accidentally falls out, instruct the patient to perform the Valsalva maneuver - forced expiration with mouth closed.  
 ● At end-expiration immediately cover the insertion site with Vaseline gauze, a dry sterile dressing, and occlusive tape.  
 ● The nurse should immediately call the physician and prepare for re-inserting of the chest tube. While informing the physician, and prepare for re-inserting of the chest tube, place O₂ on patient and put in high-Fowlers position.  
 ● Monitor vital signs and puncture site/dressing frequently.  
 ● Monitor for signs of bleeding.  
 ● Pain management as needed with medication, repositioning, etc. |
| Pacemaker Insertion       | Assess lung sounds and respiratory status as per thoracentesis.  
Assess pacemaker capture and sensitivity. | ● Puncture of lung  
● Pneumothorax  
● Bleeding | See specific interventions on post procedure complication table. |
| Abdominal Incision        | Assess incision for open areas or signs that it is not healing. | ● Wound dehiscence | Prevention:  
 ● Splinting incision with a pillow or blanket when coughing or doing deep breathing exercises.  
 ● Abdominal binder  
 ● Adequate protein for wound healing  
 ● Stool softener  
 ● No straining, bending or lifting during the Immediate post-operative period. |
| Procedural or Surgical Patient | Identify what type of sedation utilized and assess for associated side effects. | ● Respiratory Depression  
● Atelectasis  
● DVT, PE | See specific interventions on post procedure complication table. |
### Post Procedure Complications: Symptoms & Interventions

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| Femoral Artery Catheter Approach for Peripheral or Cardiac Procedures | Assess femoral pulses and groin site per policy. | ● Groin hematoma/bleeding  
● Retroperitoneal bleeding | See specific interventions on post procedure complication table. |

<table>
<thead>
<tr>
<th>Central Line Central Line Insertion Includes Dialysis Catheters</th>
<th>Immediate Complications</th>
<th>Signs/Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Bleeding</td>
<td>Frank blood at the insertion site, bloodstained dressing, bruising</td>
</tr>
<tr>
<td></td>
<td>Arterial puncture</td>
<td>Bright red blood return with high back pressure.</td>
</tr>
<tr>
<td></td>
<td>Arrhythmia</td>
<td>PVCs</td>
</tr>
<tr>
<td></td>
<td>Air embolism</td>
<td>Chest pain, dyspnea, apprehension, tachycardia, syncope</td>
</tr>
<tr>
<td></td>
<td>Pneumothorax or Hemothorax</td>
<td>Sharp chest pain, cough, decrease in breath sounds, dyspnea, cyanosis, shock, decreased SPO2</td>
</tr>
</tbody>
</table>

### Delayed Complications

<table>
<thead>
<tr>
<th>Infection</th>
<th>Increased temp, chills, lethargy, tachycardia, hypotension</th>
</tr>
</thead>
<tbody>
<tr>
<td>Venous thrombosis, pulmonary emboli</td>
<td>Acute pleuritic chest pain, shortness of breath, unilateral edema of the arm, neck or face on the side of the catheter</td>
</tr>
<tr>
<td>Catheter migration</td>
<td>Pain, edema of neck, chest or arm on catheter side, inability to aspirate blood, sluggish IV rate</td>
</tr>
<tr>
<td>Catheter embolization</td>
<td>Irregular pulse, chest pain, dyspnea, elevated temp.</td>
</tr>
<tr>
<td>Myocardial perforation</td>
<td>S/S of tamponade including hypotension, distended neck veins, low urine output</td>
</tr>
<tr>
<td>Nerve injury</td>
<td>Tingling of fingers, pain in arm, paralysis</td>
</tr>
</tbody>
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*** As for any patient complication, notify the Physician (who performed the procedure) IMMEDIATELY. And activate the Rapid Response Team if needed. ***
# Post Procedure Complications: Symptoms & Interventions

## Cardiac Complications

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<th>Interventions/Treatment</th>
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| Bleeding           | ● Liver, spleen laceration from CT Insertion  
                   ● Bleeding from procedure site  
                   ● Arterial puncture with central line insertion | ● Hypotension or decreasing blood pressure  
                   ● Tachycardia  
                   ● Bleeding may be internal | ● Draw labs H/H, coags, and type for blood  
                   ● Apply pressure to bleeding site if applicable  
                   ● Implement Massive Hemorrhage policy as needed / Implement Code Blood Bank |
| Groin Hematoma     | ● Bleeding from groin puncture site         | ● Bleeding at puncture site  
                   ● Expanding mass surrounding puncture site       | ● Apply pressure at puncture site  
                   ● Flat bed rest  
                   ● Empty bladder (full bladder presses on femoral artery)  
                   ● Mark area to monitor for expansion  
                   ● Depending on amount of bleeding, monitor hemoglobin and type and screen in case transfusion is needed.  
                   ● If severe, may need to implement Code Blood Bank. |
| Retroperitoneal Bleeding/ Hematoma | ● Serious complication from arterial groin puncture | ● Hypotension and Tachycardia  
                   ● Flank pain  
                   ● Vague abdominal or back pain.  
                   ● May not see any hematoma if bleeding is all internal  
                   ● Severe – abdominal distension | ● IV fluids  
                   ● STAT hemoglobin and type/screen  
                   ● Prepare for CT scan  
                   ● May need to implement Code Blood Bank. |

## Respiratory Complications

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| Air Embolus        | ● Central line insertion or removal         | ● Chest pain,  
                   ● Dyspnea,  
                   ● Apprehension  
                   ● Tachycardia  
                   ● Syncope   | ● Immediately place in left lateral decubitus and trendelenburg position.  
                   ● Key points to avoid air embolism when removing CVC:  
                   ● Inform the patient  
                   ● Place the patient supine (they should not be sitting or upright).  
                   ● Instruct the patient to hold their breath and perform the Valsalva maneuver (forced expiration with the mouth closed) when the catheter is being removed.  
                   ● If the patient is unable to cooperate with instructions, the catheter should be removed following inspiration.  
                   ● Cover the insertion site immediately with sterile gauze, maintain firm manual pressure until hemostasis is achieved. Then cover the site with an air-occlusive dressing, which should remain in place for 24-72 hours.  
                   ● See Care Coordination Manual for Central Venous Catheter Policy. |
| Respiratory Depression | ● Over-sedation  
                   ● Inability of body to metabolize narcotics/sedatives especially in elderly  
                   ● BiPAP/CPAP not re-instituted | ● Change in level of consciousness  
                   ● Lethargy  
                   ● Respirations <8bpm  
                   ● Shallow respirations | ● Stimulate patient  
                   ● Stop PCA/Epidural  
                   ● Chin, jaw tilt  
                   ● Bag patient  
                   ● Narcan per emergency intervention protocol |

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## Post Procedure Complications: Symptoms & Interventions

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| Atelectasis                           | ● Respiratory muscle paralysis from anesthesia or analgesics           | ● Diminished lung sounds over atelectic area  
● Positive egophony over affected area  
(during auscultation when the client speaks and E, it sounds like an A)  
● Asymmetrical density changes on CXR  
● Decreased SpO₂ and pO₂  
● Dyspnea                                | Re-expand lung  
● Incentive Spirometry  
● Deep breath and cough  
● Analgesics to control pain  
● BIPAP/CPAP mask  
● Aerosol treatments  
● Bronchoscopy                                                                                       |
| DVT (Deep Venous Thrombosis)          | ● Blood stasis  
● Immobility  
● Recent surgery  
● Discontinuation of anticoagulants for procedure  
● Pregnancy  
● History of DVT | ● Unilateral swelling of extremity  
● Redness  
● Pain or tenderness  
● Increase in temperature in affected extremity                                                  | ● VTE prophylaxis should be in place for all high risk patients  
● Early mobility – ambulate within 24 hours of admission or surgery unless contraindication  
● VTE treatment  
● Prepare for Doppler scan  
● Anticoagulation  
● Assess for PE                                                                                     |
| Pulmonary Embolus (PE)                | ● Blood stasis  
● Immobility  
● Recent surgery  
● Discontinuation of anticoagulants for procedure  
● Pregnancy  
● History of DVT | ● Symptoms depend on severity  
● Dyspnea/Tachypnea – use of accessory muscles  
● Tachycardia  
● Pallor or cyanosis  
● Sharp, pleuritic chest pain. Worse with deep inspiration  
● Anxiety – feeling of impending doom  
● Massive PE  
● Hypotension (SBP <90 or 40mmHg or greater drop in SBP)  
● Distended neck veins  
● Hemodynamic instability                                                                   | ● Initiate treatment ASAP as many patients will die within the first few hours.  
● Respiratory support (Oxygen, bagging, intubation, etc.)  
● Prepare to get CT scan  
● Prepare for possible embolotomy, thrombolitics, or anticoagulation  
● IVC (inferior vena cava) filter – later treatment.                                                   |
| Hemorthorax                           | The most common cause is chest trauma. It can also occur in patients who have:  
● Blood clotting defect  
● Chest (thoracic) or heart surgery  
● Death of lung tissue (pulmonary infarction)  
● Lung or pleural cancer  
● Tear in a blood vessel when placing a central venous catheter or chest tube  
● Tuberculosis | ● Diminished lung sounds over affected area  
● Positive egophony over affected area  
● Decreased SpO₂ and pO₂  
● Dyspnea  
● Basilar infiltrates, loss of costophrenic angles and cardiac outline on CXR.  
● May resolve without treatment.  
● Incentive Spirometry  
● Deep breath and cough  
● Chest tube insertion or thoracentesis if pleural effusion is large and symptomatic               |                                                                                                           |

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| **Pneumothorax**  
Collection of air or gas in the pleural space that separates the lung from the chest wall. | ● Leakage of air into open pleural space at the time of surgery.  
● Blunt trauma  
● Air leak from central line insertion or post biopsy  
● Spontaneous pneumothorax | ● Diminished or absent lung sounds over the affected lung  
● Dyspnea  
● Tachypnea  
● Acute pain on affected side of the chest  
● Decreased SaO\textsubscript{2} and pO\textsubscript{2}  
● SQ emphysema  
● Black area over lung field with no lung markings on CXR | ● Tension pneumothorax will present with hemodynamic instability --- needs immediate chest tube insertion or needle decompression.  
● May resolve without treatment  
● Chest tube insertion  
● Pleurodesis and surgery (VATS) |

| **Re-expansion Pulmonary Edema**  
● Throacentesis  
● Re-expansion of lung after pneumothorax |          | ● Decreased SpO\textsubscript{2} and pO\textsubscript{2}  
● Dyspnea  
● Rales throughout | ● CXR  
● Probably Lasix  
● CPAP/BiPAP |

**Other Complications**

| **Wound Dehiscence**  
● Mechanical failure of wound healing.  
● May lead to evisceration (a portion of the organ is exposed and protrudes through the incision ie. Loop of bowel)  
● It can occur early or late in the post-operative period (most occur within 4-14 days post-op)  
● Early post-operative wound dehiscence is a surgical emergency.  
● Late complication is incisional hernia which can lead to bowel obstruction, ischemia or even death.  
● Risk factors: age, male sex, chronic pulmonary disease, ascites, anemia, emergency surgery, post-operative coughing, vomiting or distention, wound infection and the type of surgery.  
● Other factors include: malignancy, obesity, poor nutrition, sepsis, diabetes and chronic glucocorticoid therapy. | ● Pulling or ripping sensation  
● Patient reports “something has given way”  
● Serosanguinous drainage may be present from the wound prior to the dehiscence | ● Have patient lean back against the bed.  
● Lower the HOB until its flat or elevated no more than 20 degrees.  
● Bend knees and avoid coughing  
● Sterile towels soaked in saline should be placed if the nurse suspects any exposed bowel.  
● Monitor vital signs frequently. |

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Post Procedure Complications: Symptoms & Interventions

References:


By Rebecca Culp, Jamie Lafollett, Cheryl Herrmann, and Samer Sader, MD (July 2014)