Pre & Post operative management of The Thoracic Surgical patient

Karen Byers, PA-C
Henry Ford Hospital
Detroit, MI
Objectives

1. Identification and pre operative evaluation of the thoracic surgical patient
2. Brief overview of the differences between VATS, robotic, and thoracotomy approaches
3. Pre operative patient education including exercise recommendations
4. Post operative patient education and management
5. Post operative device education (i.e., chest tubes, pneumostat devices, pleur-evacs)
6. Post operative device management
7. Post discharge care and follow up
Who is the thoracic surgical patient?
The thoracic surgical patient is..

- Pulmonary Nodules, Masses, or disease for diagnosis or resection
- Pleural/pericardial effusion treatment
- Thoracic esophageal abnormalities or malignancies for treatment or resection
- Mediastinal masses or lymphadenopathy for diagnosis or resection
- Chest wall nodules, masses
- Other non-specified thoracic cavity abnormalities requiring surgical intervention
How do I evaluate the patient?

- Full, pertinent History & physical
  - Important to include daily medications, tobacco/ETOH/illicit drug use
- Pre-operative risk assessment including cardio-pulmonary & functional status
  - Cardiac evaluation & clearance for moderate-high risk cardiac patients
  - Pulmonary function evaluation
  - Functional status assessment
The ideal surgical patient..
How do I assess the patient’s pulmonary and functional status?

- **Pulmonary function**
  - To determine tolerance for lung resection and overall ability to undergo surgery
  - Patient provided with an Incentive spirometer with proper instruction for use at time of pre operative instructions
  - Patient educated on the importance of spirometry use in the pre/peri/post-operative period

- **Functional status**
  - Ability to walk >1 block/ >1 flight of stairs is a good indicator of pre operative functional status
  - Daily ambulation/physical activity encouraged at time of pre operative instructions
  - Patient educated on importance of pre/peri/post-operative activity
  - *Certain literature suggests a decrease in post operative pulmonary complications with aggressive pre/peri/post-operative spirometry use & ambulation*
What is a VATS?
VATS
Video Assisted Thoracoscopic Surgery

- VATS- minimally invasive
  - Performed via 2-3 small ~2cm incisions
  - Camera inserted between the ribs for further thoracic cavity/lung evaluation
  - Wedge resections, segmentectomy
  - Thoracic cavity biopsies- pleural, mediastinal lymph node, lung
  - Usually closed via sub-q sutures with steri-strips applied for support
  - Robotic approach now replacing certain VATS procedures
VATS
Video Assisted Thoracoscopcy
Robotic assisted lung resection
Thoracotomy

- Traditional long, open posterior lateral chest wall approach or the revised mid axillary smaller vertical incision
  - Better suited for lobectomies, pneumonectomies, large thoracic cavity/mediastinal masses
  - Exposure obtained by surgical rib separation
  - Usually closed with rib cage re-approximation
  - Skin closure via sub-q sutures or with staples

*** Therefore, longer hospitalization, longer recovery time, higher morbidity, more painful
Thoracotomy
Right lateral and Left lateral
What happens after the surgery is completed?

- POD #1-2– chest tube(s) placed to water seal, eventually removed once air leak resolves depending on progress.
- Recent literature noting early placement to water seal decreases air leak time, especially in patients with COPD/ compromised lung function
  - Pulmonary toilet- incentive spirometry use**
  - Ambulation**
  - Bronchodilator therapy- albuterol/atrovent
  - Pain control
  - Bowel regimen
  - Incision/wound care daily, post op dressings removed on POD #2
  - CT dressings changed at least daily or as needed

**Pulmonary toilet and ambulation are essential to the thoracic surgical patient**
Post operative persistent air leaks

- Persistent air leaks present on the pleur-evac
  - Changed to water seal on POD #1-2
  - Follow up CXR daily and with any significant change in patient condition.
  - If patient is medically ready for discharge and a small- moderate air leak persists then a pneumostat is placed to the chest tube to facilitate earlier discharge to home
  - For the +4/severe air leaks, the patient usually won’t tolerate a pneumostat
  - Return to clinic for weekly device checks for possible removal
  - Pulmonary toilet/pain control/ambulation remain essential to recovery
Pleur-evac

- Sterile, single use unit for fluid/air evacuation and assistance with lung re-expansion
- Attached to the chest tube in the OR prior to end of procedure
- Drainage and presence of air leak monitored
- Grading of air leaks done via the air leak chamber’s markings
- Usually placed to water seal on POD #1
Pneumostat device
Drainage & Care of the pneumostat device

A disposable, single patient use chest drain valve with 30ml collection volume to evacuate air from the chest cavity

- Drain the pneumostat as needed using a luer-lock syringe.
- Firmly screw the luer-lock onto the port located on the bottom of the Pneumostat.
- Pull the plunger back to empty the fluid. When the syringe is full, unscrew the syringe and empty the fluid into the nearest suitable receptacle. Repeat as necessary.

If it becomes difficult to empty the fluid using a syringe, squirt water through the port to flush out the blockage or consult the physician. The Pneumostat may need to be changed out.
Pneumostat device, con’t..

1. Do not obstruct the air leak well.
2. Do not clamp the patient tube during use.
3. Do not use or puncture the needleless luer port with a needle.
4. Do not leave a syringe attached to the needleless luer port.
5. Do not connect any luer-lock connector to the needleless luer port located on the bottom of the chest drain valve.
6. Clean the chest tube site daily and drain the pneumostat device as needed.
7. Change the chest tube site dressings daily and as needed.
8. If the pneumostat comes apart from the chest tube, re-insert the pneumostat and tape the connection

- **IMPORTANT**: If at any time there are any concerns call the physician’s office or have the patient present to the nearest ER for further evaluation
Heimlich Drain Valve

- Small one-way valve placed to the chest tube for air/fluid drainage into a small, flexible collection device
PleurX catheter and drainage kit

- Small flexible catheter placed in the thoracic cavity for recurrent pleural effusions, sutured in place, covered with a sterile tegaderm
- Low infection rates (less than 3%)
- Reduces re-admission rates for recurrent pleural effusions
- Home care RN set up at time of discharge for every other day drainage
- Drainage kits supplied for easy, quick drainage on a negative pressure system
- Can remain for days-months or as long as needed for drainage
- Easily removed in office once output <50cc on 3 consecutive drains
Pleur-evac pneumonectomy unit

- Used for the post esophagectomy, post pneumonectomy patients
- Large capacity collection; 2350 cc disposable unit
- Self-regulating pressure control: Positive pressure and negative pressure are limited to facilitate drainage and to help re-establish normal intra-thoracic pressure and avoid a potential mediastinal shift
- Can’t be placed to suction, protecting the post esophagectomy & post pneumonectomy patient
Post operative home course

- Post discharge day #1- telephone call placed to patient/family to assess status, answer questions
  - Post operative pain, incision care, bowel regimen most FAQ’s
  - Oxycodone, robaxin, & senokot are the discharge medications of choice
- Seen in clinic post discharge within 1-2 weeks with a chest xray
  - 1 week post discharge follow up for the pneumostat device check, then weekly until chest tube is removed
  - Otherwise follow up in 2 weeks post discharge
  - Follow up every 3-4 months with CXR/CT for the patients with cancer, otherwise prn basis
References

9. Images courtesy of google images
Thank you for your attention!
Questions?