Spontaneous Pneumothorax Care Guideline

Inclusion Criteria:
- Primary spontaneous pneumothorax
- Children 10 years and older

Exclusion Criteria:
- Trauma, iatrogenic pneumothorax, tension pneumothorax
- Secondary spontaneous, pneumothorax (due to underlying pulmonary disease, i.e. cystic fibrosis, asthma, connective tissue disorders)
- Empyema
- Unstable patient requiring PICU care

Assessment
- Respiratory status, O2 saturation, vital signs
- History and Physical
- CXR: 1 view upright

Small Pneumothorax Asymptomatic ≤ 20% *or* < 2 rib spaces

Interventions
- ED to consult surgery
- PRN oxygen for desaturation
  - No need for O2 with nonrebreather mask unless respiratory distress
  - If desatting, may need chest tube placed – also move to "Large/ Symptomatic Pathway"
- Repeat CXR in 4 - 6 hours
- Stat CXR for acute change in respiratory status
- If resolved or is decreased, ok to discharge if meets criteria or admit to surgery for observation
- If worsening on CXR, ED to place chest tube
- If patient does not meet discharge criteria, admit to surgery – NPO after midnight for VATS

Worsening Pneumothorax

Large Pneumothorax and/or Symptomatic ≥ 20% or > 2 rib space

Interventions
- Admit to surgery
- Chest tube or pigtail insertion in ED or PICU with sedation
- Place chest tube to -20cm H_2O continuous suction
- CXR after chest tube placement and PRN acute change in respiratory status
- If CXR with no improvement, troubleshoot chest tube
- Evaluate for air leak
  - If air leak > 48 hours proceed to VATS

Indications for Surgery
- Parents and surgeon decide on primary VATS
- 2nd or more occurrence of spontaneous pneumothorax
- Worsening pneumothorax or air leak > 48h

Surgical Intervention
- VATS, blebectomy, pleurectomy/pleurodesis (mechanical and/or chemical and chest tube placement)

Discharge Criteria
Patients who did not require an intervention:
- Off supplemental oxygen with stable vital signs
- Ambulating with pain well controlled
- Tolerating a regular diet
- Discharge education completed including return precautions
- Follow up with PMD

For patients who required an intervention:
Needs to meet above criteria plus:
- For patients treated with VATS, chest tube or pigtail insertion
  - Monitor patient for 4-6 hours post-pull
  - If stable without signs or symptoms, may discharge home
  - Post-pull CXR only if symptomatic or at the attending Surgeon's discretion
    - If post-pull CXR stable, may discharge home
    - If post-pull CXR with worsened or recurrent pneumothorax, intervene as Surgeon indicates
- Follow up with Surgeon in 2-3 weeks

Post-Op Care
- Maintain chest tube to 20cm suction until air leak resolves or for minimum 48 hours
- Follow ERAS protocols
- Utilize portable suction to ambulate while CT to suction
- Incentive spirometry
- Pain management – no contraindications for ketorolac postop
- Consider CXR prior to placing to water seal
- Repeat CXR after placing to water seal, place back to suction for air leak or worsening pneumothorax – needs surgical evaluation vs blood patch if ongoing air leak > 48hrs
  - If stable, may remove chest tube

Recommendations/Considerations
- Signs and symptoms of pneumothorax: tachypnea, hypoxia, shortness of breath, chest pain/discomfort
- CT scan not routinely indicated, but may be ordered based on family/patient/surgeon preference
- Surgery team to discuss option of primary VATS with patient/family
- VATS for other indications i.e.: Empyema – use Empyema Care Guideline
- For post-surgical air leak > 5 days, may consider blood patch, Heimlich valve, or return to OR
  - If Heimlich valve placed, repeat CXR the next day
  - May discharge home if pneumothorax stable or smaller
  - Weekly CXRs and follow up with surgeon
- Outpatient referral/evaluation with Genetics if concerned for possible Marfan Syndrome

Discharge Instructions / Follow Up Recommendations
- No PE, contact sports, airplane travel, high altitude, swimming or breath-holding activities for 6 weeks after pneumothorax has resolved
- Leave chest tube dressing in place x 3 days after removal. It is normal to have some clear pink/yellowish drainage for 1-2 days after chest tube removal
- Once chest tube dressing is removed, may bathe normally. If site is still slightly open, cover with a band-aid until scabbed over
- Return to CHOC ED with any signs or symptoms of recurrent pneumothorax

Patient Education
- Cerner – Pneumothorax Patient/Family Education
- Prevention of Surgical Site Infection (SSI) handout

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References

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