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Empyema (infection of the lung cavity)

Patient and family information, brought to you by the Education Committee of APSA

Overview - “What is it?”

An empyema is a collection of pus in the chest cavity between the lung and the inner surface of the chest wall. The most common cause is pneumonia, an infection of the lung. Other causes include trauma, cancer, injury to esophagus or complication of chest surgery. The pus may fill the whole chest cavity or it may be localized collection. The infection is typically caused by certain bacteria that lead to pneumonia (lung infection).

Approximately 1 in every 150 children with pneumonia will also develop empyema. Empyema risk is higher in children 2-4 years of age. Empyemas occur twice as often in the spring and winter than they do in the fall and summer. Boys and girls are affected similarly. Children younger than two years of age have the highest risk of dying.

Signs and Symptoms - “What symptoms will my child have?”

Early signs: The most common signs and symptoms of empyema in children are fever, decreased appetite, lethargy, cough, chest pain and difficulty breathing.

Later signs/symptoms: Weight loss may be noted in children with severe pneumonia and empyema because of decreased appetite.

Diagnosis - “What tests are done to find out what my child has?”

Physical Exam: Your doctor may notice a decrease in normal lung sounds on the side of the pneumonia and empyema. An increase in rate of breathing may also be noted.

Labs and tests: Basic blood tests will be performed. Samples of phlegm or sputum to look for a bacterial or viral infection will be performed. **Chest X-ray** is needed to look at the extent of pneumonia in the lungs and fluid surrounding the lung. To get a better view of the empyema, an **ultrasound or computed tomography (CT)** may be performed as well.

Conditions that mimic this condition: Pneumonia without fluid/empyema, cystic fibrosis, tumors/cancer, congenital pulmonary cysts/sequestration

Treatment - “What will be done to make my child better?”

Medicine: Medicines that fight infection (antibiotics) are given to treat pneumonia. The type of antibiotic given is the one to which the bacteria causing the infection is most sensitive. Pain medications may be needed because pneumonia and empyema can be painful. Most children need breathing treatments (inhalers) to help open up their air passages.

Surgery: If the child continues to have fevers, malaise, and decreased appetite along with needing more oxygen support, then surgical drainage may be helpful. There are two main procedures for draining the empyema.

Chest Tube Placement: The tube goes through the skin, in between the ribs and into the chest cavity where the fluid is located. The tube is placed by a surgeon, critical care doctor or interventional radiologist. If the fluid is thin, it will drain out through the tube. If the fluid is thick and semi-solid, medicine to thin out the fluid is given through the tube, allowing the thinner fluid to drain.

Video-Assisted Thoracoscopic Surgery (VATS): Sometimes, antibiotics and tube drainage are not totally successful in draining the infected fluid. In VATS, small cuts are made on the chest wall through which a telescope and small instruments are inserted, manually removing solidified pus and tissue. This surgery allows the lung to expand fully. A tube will be left in the chest cavity to allow for additional drainage of fluid.

Thoracotomy: In some situations, the empyema is so severe that VATS cannot treat it. An incision is made in between the ribs along the side of the chest. The infected material is removed through this incision.

Preoperative preparation: Several hours prior to surgery, your child will have to stop eating so that they can have an empty stomach in preparation for administration of anesthesia.

Postoperative care: Depending on the status of breathing and need for oxygen, your child may be monitored in the intensive care unit following surgery. They will likely have a chest tube to allow for additional drainage of fluid which will be removed a few days after surgery once the drainage has decreased. Antibiotics and pain medications will continue to be given.

Risks/Benefits of Surgery: The main risks of surgery are bleeding and infection. There is also a risk of injury to the lung. The risks of not performing the surgery include worsening respiratory status, having uncontrolled infection, spreading of the infection into the blood stream and ongoing damage to the lung.

Home Care - “What do I need to do once my child goes home?”

Diet: Your child may resume a regular diet.

Activity: Depending on the incision used for the surgery, your child will likely be able to return to normal activities once the pain resolves and the pneumonia is treated.

Wound care: The chest tube is usually removed in the hospital before discharge. You may need to use small bandages or band-aids for the chest tube wound(s) until they scab over. Surgical incisions should be kept clean and dry for a few days after surgery. Most of the time, the stitches used in children are absorbable and do not require removal. Your surgeon will give you specific guidance regarding wound care, including when your child can shower or bathe.

Medicines: Your child may be sent home on some antibiotics for the pneumonia. Medicines for pain such as acetaminophen (Tylenol) or ibuprofen (Motrin or Advil) or something stronger like a narcotic may be needed to help with pain for a few days after surgery. Stool softeners and laxatives are needed to help regular stooling after surgery, especially if narcotics are still needed for pain.

What to call the doctor for: Fevers, increased pain, difficulty breathing or any redness/drainage around the incisions.

Follow-up care: Your child should follow up with his or her surgeon 2-3 weeks after surgery to ensure proper postoperative healing. Follow up with the child’s pediatrician or a lung specialist may also be needed.

Long Term Outcomes - “Are there future conditions to worry about?”

- Overall long-term outcome is quite good in children with pneumonia and empyema.
- The chest X-ray findings return to normal in about 3-6 months
- Most children have normal lung function after 6 months to a year and can resume all normal activities.

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