

A photograph of a baseball player in a white pinstriped uniform sliding into a base. The player is wearing a red helmet and is in a dynamic, low-to-the-ground position. The background is a blurred green field. The text is overlaid on the right side of the image.

Concepts of Athletic Training

**FIFTH
EDITION**

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Chapter 13

Injuries to the Thorax and Abdomen

Anatomy Review

Thoracic cage has 12 pairs of ribs.

- The first 7 pairs connect directly to sternum.
- Pairs 8 through 10 connect via common costal cartilage.
- Pairs 11 and 12 are “floating ribs.”

Major thoracic joints include:

- Intervertebral.
- Sternoclavicular.
- Sternocostal.
- Costochondral.

Anatomy Review (cont.)

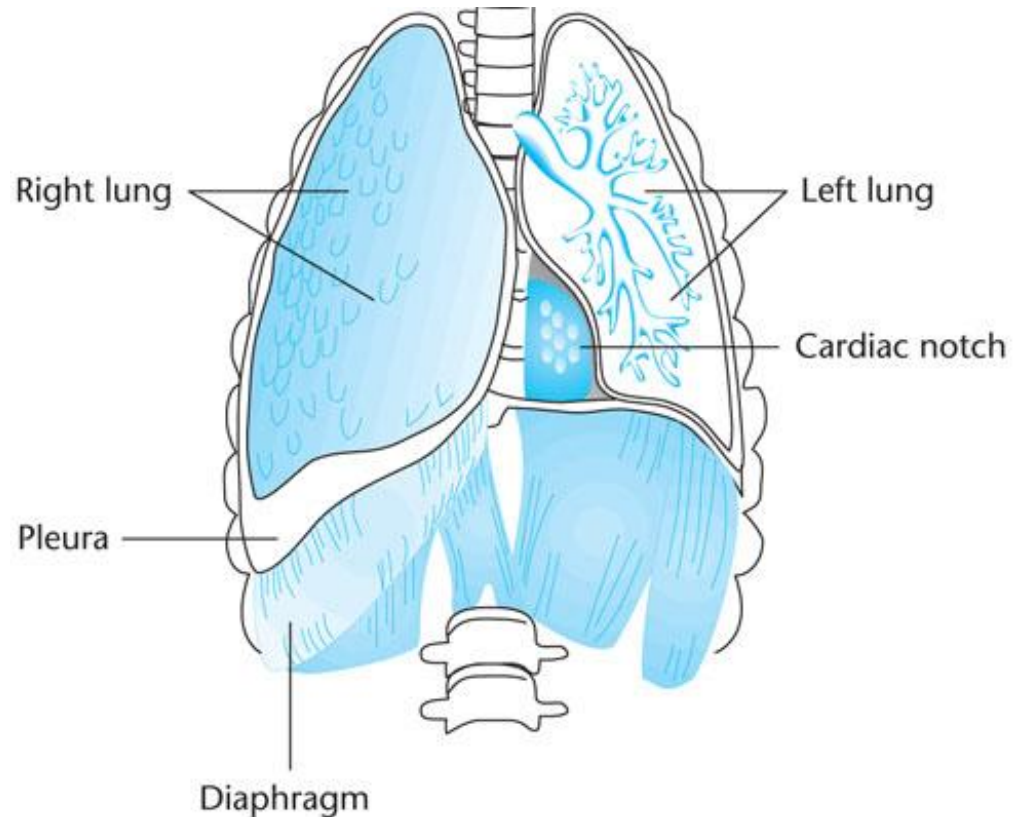
Muscles of the trunk include:

- Internal and external intercostals.
- Pectoralis major & minor.
- Rectus abdominis.
- Internal/external obliques.
- Trapezius.
- Rhomboids.
- Latissimus dorsi and others.

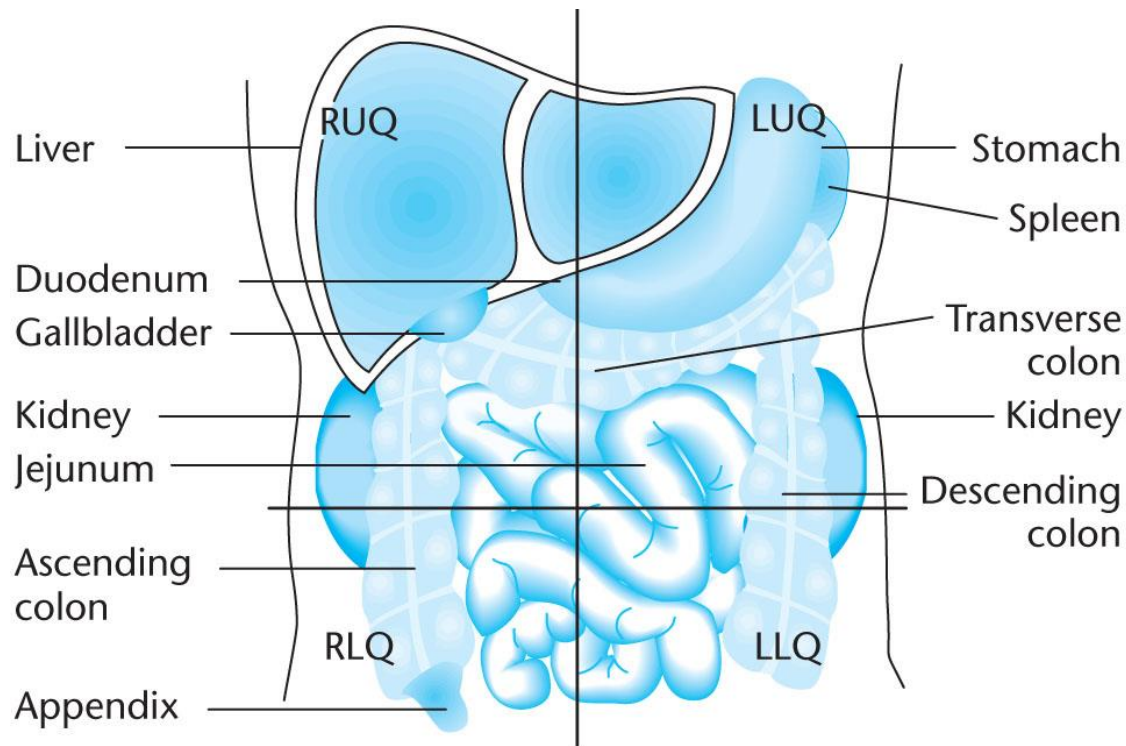
Anatomy Review (cont.)

Internal thoracic organs and major blood vessels:

- Heart & pericardium.
- Lungs & pleura.
 - Thoracic aorta.
 - Pulmonary artery & veins.
 - Vena cava.
- Trachea & esophagus.
- Thymus gland.
- Lymph nodes.



Anatomy Review



Abdominal quadrants

- Right Upper
- Left Upper
- Right Lower
- Left Lower

Abdominal Quadrants

Abdominal Organs and Structures

Right Upper contains:

- Liver, gallbladder, and right kidney.

Right Lower contains:

- Appendix and ascending colon.

Left Upper contains:

- Stomach, spleen, left kidney, and pancreas.

Left Lower contains:

- Descending colon.

Common Sports Injuries

- Fractures can occur to ribs, sternum, clavicle, or thoracic vertebrae.
 - Injuries must be treated immediately to avoid **pneumothorax** or **hemothorax**.
- Joint dislocations and subluxations of thoracic skeletal joints can occur.
- Costochondral separations involve disunion of sternum and ribs.

Common Sports Injuries (cont.)

Signs and symptoms of rib fractures include:

- Extreme localized pain that is aggravated by sneezing, coughing, and forced inhalation.
- Athlete grasps chest wall at point of injury.
- Mild swelling at site; there may be bony deformity.
- Breathing difficulties; rapid shallow breathing.

First Aid

- Monitor vital signs and watch for respiratory distress.
- Transport to medical facility.

Common Sports Injuries (cont.)

Signs and symptoms of subluxations and dislocations include:

- History of snap or popping sensations.
- Pain and tenderness over costochondral junction.
- Palpable defect may be felt, and swelling in the localized area.
- Maximum or near-maximum inhalation may be very difficult.

First Aid

- Apply ice and light compression immediately.
- Treat for shock and transport to medical facility.

Common Sports Injuries (cont.)

Breast Injuries

- Women experience contusions from direct contact in some sports.
- A sports bra does not provide protection but can provide comfort and support.
- “Going braless” during athletic activity can stretch breast tissue resulting in loss of contour.
- Nipple irritation occurs in some athletes from shirts chafing the tissue.
- Placing a bandage directly over the nipple during training and competition prevents irritation.

Heart Injuries

- While rare, contusions to the chest wall can bruise the heart, resulting in death.
 - **Commotio cordis** can occur.
- Use of AED device is the most practical way to save the lives of people experiencing commotio cordis.

Heart Injuries (cont.)

Blunt trauma to the chest can also cause aortic rupture, damage to the pericardium, or valvular damage.

- Aortic injury is often fatal and must be given immediate attention.
- Closely observe any athlete with chest injury for breathing problems, fainting, decreases in heart rate and blood pressure, and complaints of severe chest pains.

Lung Injuries

- Pulmonary contusions may occur as complication of rib fracture, contusion, or other type of lung injury.
- Fractured rib can puncture pleural sac, causing pneumothorax.
 - Spontaneous pneumothorax can occur without trauma (reported in weight lifters and runners).
- Hemothorax occurs when fractured rib punctures lung.
 - This condition can be life threatening.

Lung Injuries (cont.)

Signs and symptoms include:

- Severe pain in chest, sometimes radiating to thoracic spine.
- Breathing problems (dyspnea).
- May have nonproductive cough and tachycardia.

Lung Injuries (cont.)

First Aid

- Treat for shock.
- Monitor vital signs.
- Transport to medical facility immediately.

Internal Injuries to the Thorax and Abdomen

Liver, Kidneys, Spleen, and Bladder Injuries

- Although fairly safe, the liver is susceptible to blunt trauma.
 - Diseases such as hepatitis make liver more vulnerable.
 - Heavy consumption of alcohol and/or use of steroids damages the liver.

Internal Injuries to the Kidneys

- Kidneys are susceptible to blunt trauma directed at the lower back.
- Kidneys may also be injured as a result of heat stroke
 - Be alert for hematuria.
- Refer athlete to a physician.

Internal Injuries to the Spleen

The spleen is susceptible to blows in the Left Upper Quadrant.

- The organ serves as a reservoir for RBCs.
- It has an ability to “splint” itself when lacerated.
- Be alert for Kehr’s sign.
- Athlete recovering from mononucleosis **MUST** be cleared by a physician to return to participation.

Internal Injuries to the Bladder

The bladder is not commonly injured in sports.

- A direct blow to the bladder may injure the organ.
- Signs are pain in the area and blood in urine.

To avoid injury, encourage athletes to empty their bladder prior to participation.

Prevention of Internal Injuries

- Some sports require protective equipment that may prevent injuries to the heart, lungs, and chest.
- Sports that do not require chest protection should educate athletes on how to protect the chest when specific situations arise.
- CPR and AED-trained personnel should be available to provide immediate care.

Preexisting Conditions

- It is important to review each athlete's medical history very closely to determine if a cardiac or respiratory condition may be present.
- Preexisting conditions may disqualify an athlete from activities that place excessive stress on the affected systems.
- These conditions may include: HCM, heart murmurs, cystic fibrosis, or COPD.