Chest and Lung Examination

Statement of Goals

Understand and perform a complete examination of the normal chest and lungs.

Learning Objectives

A. Locate the bony landmarks of the normal chest:
   - Ribs and costal margin, numbering ribs and interspaces
   - Clavicle
   - Sternum, sternal angle and suprasternal notch
   - Scapula

B. Define the vertical "lines" used to designate chest wall locations. Use the bony landmarks and conventional vertical "lines" when describing a specific area of the chest wall.
   - Midsternal line
   - Midclavicular line
   - Anterior, mid and posterior axillary lines
   - Scapular line
   - Vertebral line

C. Describe the location of the trachea, mainstem bronchi, lobes of the lungs and pleurae with respect to the surface anatomy of the chest.

D. Prepare for an effective and comfortable examination of the chest and lungs by positioning and draping the patient. Communicate with the patient during the exam to enlist the patient’s cooperation.

E. Describe and perform inspection of the chest including the following:
   - Rate, rhythm, depth, and effort of breathing
   - Shape and movement of the chest

F. Describe and perform palpation of the chest including the following:
   - Identify tender areas
   - Chest expansion
   - Tactile fremitus

G. Describe and perform percussion of the chest, distinguishing a dull sound (below the diaphragm) from a resonant sound (over normal lung.) Use percussion to demonstrate symmetric resonance of the lung fields and to measure diaphragmatic excursion.
H. Describe and perform auscultation of the lungs including the following:

- Symmetric examination of the lung fields, posterior and anterior.
- Normal breath sounds (vesicular, bronchovesicular, bronchial and tracheal), their usual locations and their characteristics.

I. Define terms for three common adventitious lung sounds:

- Wheezes are high pitched, continuous hissing or whistling sounds.
- Crackles are brief, intermittent staccato sounds.
- Rhonchi are low pitched continuous "snoring" or "snorting" sounds.

J. Define terms for the transmitted voice sounds (bronchophony, egophony, whispered pectoriloquy)

K. Be able to recognize normal breath sounds and adventitious lung sounds.

L. Be familiar with the unique aspects of the lung exam in infants and children.

M. List usual biological changes of the aging process and how they affect physical findings for the chest and lung exam.

N. Perform a smooth, complete examination of the chest and lungs, including inspection, palpation, percussion and auscultation.

O. Document the examination of the chest and lungs in the format of a medical record.

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**Student’s Preparation for the Unit**

Special Instructions: Bring your stethoscope to class. Be prepared to practice on your classmates.

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**Curriculum Comments**

**Objective F:**

A complete lung examination includes palpating once for chest expansion. This is usually done posteriorly. However, in a bed bound patient the anterior technique may preferentially be used.
Objective K:

The following sound clips are from the R.A.L.E. Repository (www.rale.ca/Recordings..htm) and are used with permission from the author, Dr. Hans Pasterkamp and the copyright holder, Medi-Wave Inc. The sounds are password protected and will require your VCU card and EID to access.

- These bronchovesicular sounds were recorded over the right posterior lower chest of a 2 day old baby girl.
- These bronchial sounds were recorded over the right anterior upper chest of a 12 year old boy.
- These tracheal sounds were recorded over the trachea of a healthy 26 year old man. (Note: this is a stereo file with simultaneous recording over trachea and posterior right lower lung)
- This expiratory wheezing was recorded over the right anterior upper chest of an 8 year old boy with asthma.
- This wheezing and coarse crackles were recorded over the right posterior lower lung of an 8 month old boy with viral bronchiolitis.
- These crackles and bronchial breathing were recorded posteriorly over the consolidated left lower lung of a 16 year old boy with tuberculosis.
- These late inspiratory fine crackles were recorded over the right posterior lower lung of a 55 year old woman with rheumatoid lung disease.
- These crackles were recorded over the right posterior lower chest of a 9 year old boy with pneumonia.

Objective L:

Upon inspection, it can be seen that the thorax of the infant is more rounded than that of an adult. An infant predominantly uses his or her diaphragm to breath, demonstrating protrusion of the abdomen during respiration. As noted in the Vital Signs unit, the normal respiratory rate varies by age, decreasing as a child ages. The breath sounds of an infant may be louder or more harsh than in an adult secondary to the thin chest wall. A crying infant will allow you the opportunity to auscultate their lungs when they pause during inspiration.

Objective M:

In older adults decreased elastic recoil in the lungs and atrophy of alveoli affect function; on physical exam, a prolonged expiratory phase during forced expiration may be noted.

Objective O:

Examples of the documentation of a lung exam can be found in Bates pp. 19 and 266. Your documentation will vary based on the patient's physical exam findings.
Apply Your Skills

Observe chest and lung examinations done by your preceptor. Perform examinations with supervision and independently. Include the chest and lung examination in at least one of your patient encounter notes. (This week, if possible.)

If you are with a pediatric preceptor, note the shape of an infant’s chest wall and count his or her respiratory rate. Note any abdominal breathing. Ask your preceptor about signs of respiratory distress in infants and children. Watch how they are able to perform a chest and lung exam on a crying infant.

Study Questions

1. What are the bony landmarks of the chest? Can you locate them?

2. What are the vertical “lines” on the chest wall that clinicians use to help communicate location of findings?

3. Can you describe the location of the trachea, marnsten bronchia and lobes of the lungs with regard to the surface anatomy of the chest?

4. Do you know the techniques for performing a chest/lung exam?

5. What you evaluating while observing the chest/lungs?

6. What aspects of the chest/lungs are you performing using palpation?

7. What can you evaluate by percussion of the chest wall? Where should you percuss?

8. How and where should you auscultate the chest?

9. Can you identify normal breath sounds, rales(crackles), wheezes, and rhonchi (using the R.A.L.E.S. repository)?

10. What are “transmitted voice sounds”?

11. How do normal findings in the pediatric chest exam compare with normal findings of an adult?
### Chest and Lungs Examination Checklist

- Appropriate draping for all aspects of the exam (note difference for female exam)
- Appropriate guidance given to the patient throughout the exam
- Observe the rate, rhythm, depth, and effort of breathing
- Observe nailbed color on both hands
- Inspect the shape and movement of the posterior chest wall
- Palpate posterior chest wall for areas of tenderness
- Palpate the posterior chest bilaterally for chest expansion
- Palpate the posterior chest for tactile fremitus
- Percuss bilateral posterior lung fields
- Use percussion to measure diaphragmatic excursion
- Auscultate bilateral posterior lung fields
- Auscultate bilateral posterior lung fields for transmitted voice sounds (if indicated)
- Inspect the shape and movement of the anterior chest wall
- Palpate anterior chest for areas of tenderness
- Palpate anterior chest bilaterally for chest expansion
- Palpate the anterior and lateral chest for tactile fremitus
- Percuss bilateral anterior and lateral lung fields
- Auscultate bilateral anterior and lateral lung fields
- Auscultate bilateral anterior and lateral lung fields for transmitted voice sounds