

Pulmonary Physical Exam

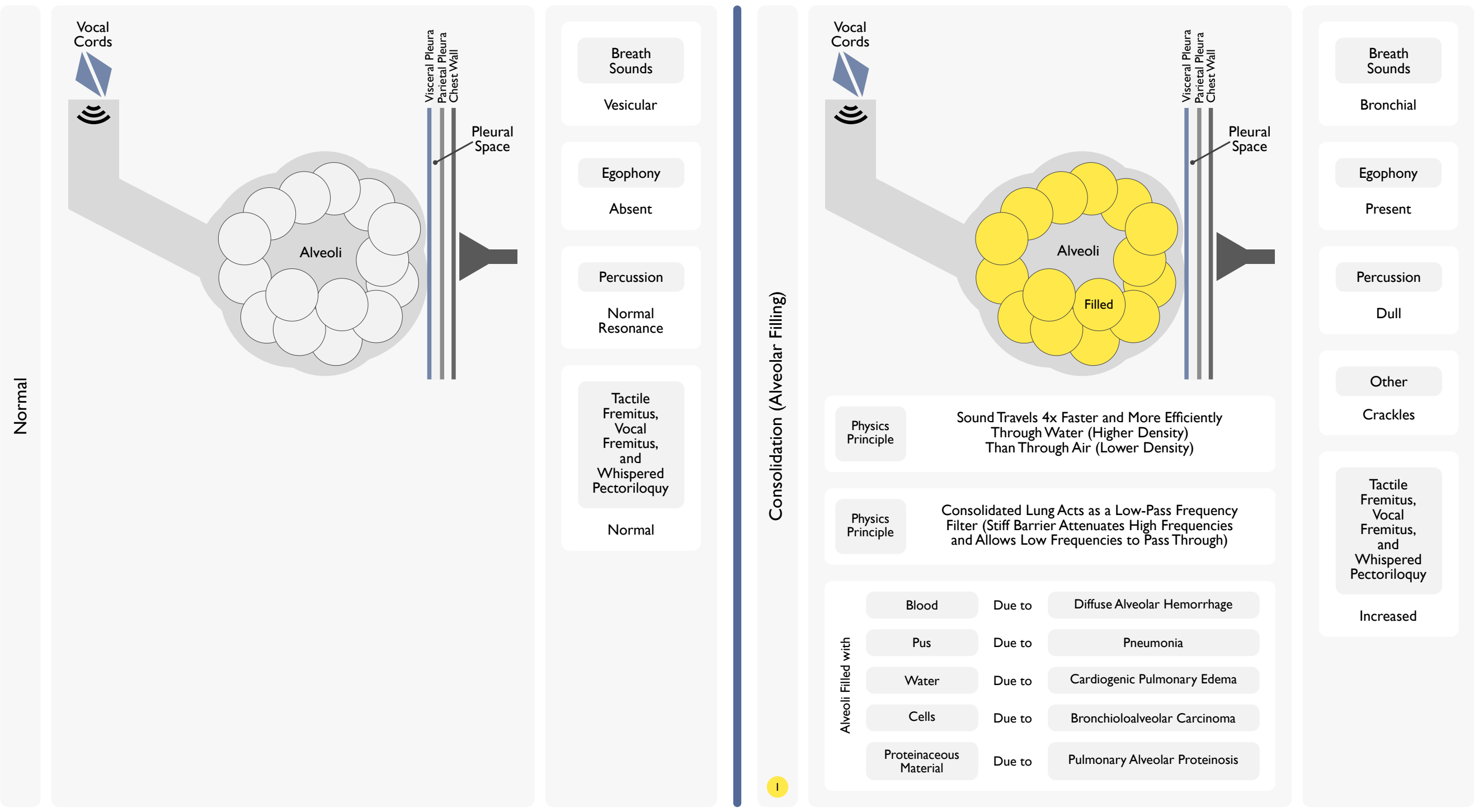
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|---|--------------------|--|---|---|
| Pulmonary Exam (Posterior) | Inspection | <div>Inspect for Accessory Muscle Use and/or Intercostal/Supraclavicular Retractions (Suggestive of Increased Work of Breathing)</div> <div>Inspect for Chest Asymmetry (Suggestive of Unilateral Volume Loss)</div> | <div>Inspect for Altered Chest Wall Shape</div> <div>Increased Antero-posterior Diameter ("Barrel Chest")</div> <div>Pectus Carinatum</div> <div>Pectus Excavatum</div> | <div>Inspect for Scars (Median Sternotomy, Thoracotomy, etc)</div> <div>Inspect for Tachypnea</div> |
| | Palpation | Palpate for Symmetric Inspiratory Chest Wall Expansion | | |
| | Auscultation | <div>Auscultate Over Trachea for Stridor</div> <div>Auscultate for Vesicular (Normal) vs Bronchial (Abnormal) Breath Sounds Over Lung Fields</div> | Auscultate for Adventitious (Abnormal) Breath Sounds | |
| | Percussion | Percuss Lung Fields to Assess for Asymmetry Which Might Indicate Consolidation, Pleural Effusion, Pneumothorax, etc | Percuss for Inspiratory Diaphragmatic Excursion | |
| | Sound Transmission | <div>Vocal Fremitus</div> <div>Say "99" or "Toy Boat" and Auscultate</div> <div>Tactile Fremitus</div> <div>Say "99" or "Scooby Doo" and Palpate with Side/Palm of Hand</div> | <div>Whspered Pectoriloquy</div> <div>Say "99" or "Slytherin Wizard" and Auscultate</div> <div>Egophony</div> <div>Say "E" and Auscultate for Change to "A"</div> | |
| Arms Crossed to Move Scapulae Laterally | | | | |

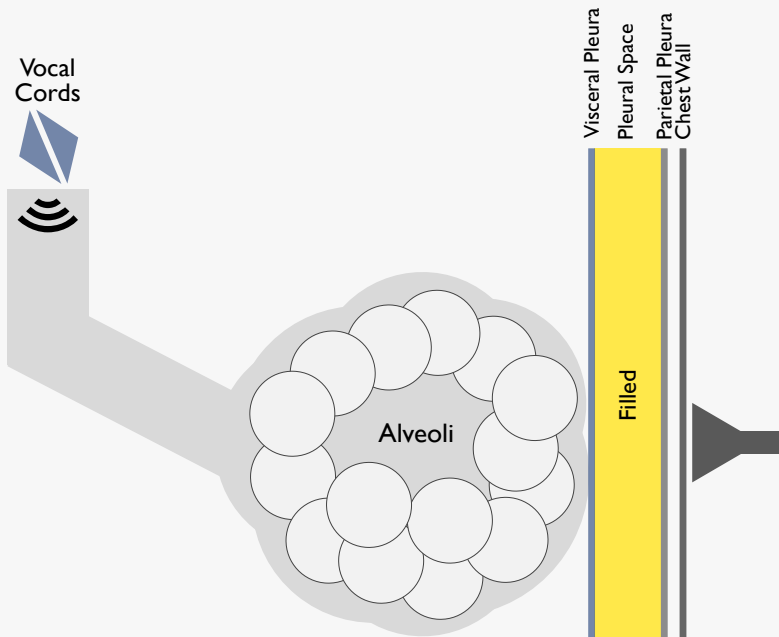
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|---------------------------|--------------------|----------|--------------------------------|
| Pulmonary Exam (Anterior) | Inspection | As Above | |
| | Palpation | As Above | Palpate for Tracheal Deviation |
| | Auscultation | As Above | |
| | Percussion | As Above | |
| | Sound Transmission | As Above | |

| | | | |
|---------------------|----------|----------------------|---|
| Extrapulmonary Exam | Cachexia | Nasal Polyps | Tonsillar Enlargement/ Oropharyngeal Crowding |
| | Clubbing | Peripheral Edema | |
| | Cyanosis | Pursed Lip Breathing | |

| Lung Sounds | | | | | | |
|---|---|---|--|---|--|----------------------------------|
| Sound | Physiology | Auscultation Characteristics | | | Associated Clinical Disorders | Other |
| <div>Normal</div> Tracheal Breath Sounds | Due to Turbulent Pharyngeal/Glottic/Subglottic Airflow (In Addition, Intrapulmonary Lung Sounds May Be Transmitted to the Trachea) | <div>Hollow</div> <div>Non-Musical</div> | Inspiratory and Expiratory | Sounds Similar to Bronchial Breath Sounds | | |
| <div>Normal</div> Vesicular Breath Sounds | <div>Due to Non-Alveolar Turbulent Airflow, Vortexes, and Other Mechanisms</div> <div>In Pathologic States, May Be Decreased by Diminished Sound Generation (Hypoventilation, Airway Narrowing) and/or Diminished Sound Transmission (Lung Destruction, Pleural Effusion, Pneumothorax)</div> | <div>Soft</div> <div>Non-Musical</div> | Inspiratory and Early Expiratory | | | |
| Bronchial Breath Sounds | Due to Patent Airway Surrounded by Consolidated Lung (Pneumonia) or Pulmonary Fibrosis | <div>Soft</div> <div>Non-Musical</div> | Inspiratory and Expiratory | Sounds Similar to Tracheal Breath Sounds | <div>Pneumonia</div> <div>Pulmonary Fibrosis</div> | |
| Fine Crackles | Not Related to Secretions | <div>Short</div> <div>Non-Musical</div> <div>Explosive</div> | <div>Mid-Late Inspiratory and Occasionally Expiratory</div> <div>Does Not Clear with Cough</div> | <div>Gravity-Dependent</div> <div>Not Transmitted to Mouth</div> <div>High Frequency (≥ 650 Hz)</div> | <div>Congestive Heart Failure</div> <div>Interstitial Lung Disease</div> <div>Pneumonia</div> | May Precede Radiographic Changes |
| Coarse Crackles | <div>May Be Related to Secretions</div> <div>Due to Intermittent Airway Opening</div> | <div>Short</div> <div>Non-Musical</div> <div>Explosive</div> | <div>Early Inspiratory and Expiratory</div> <div>May Clear with Cough</div> | <div>Transmitted to Mouth</div> <div>Low Frequency (350 Hz)</div> | Chronic Bronchitis | |
| Rhonchi | <div>Due to Rupture of Fluid Films and Abnormal Airway Collapsibility (Common with Airway Narrowing Due to Airway Edema or Bronchospasm)</div> <div>May Be Related to Secretions in Larger Airways</div> | <div>Musical</div> <div>Low Frequency (≤ 200 Hz, Sounds Like Snoring)</div> | <div>Inspiratory and/or Expiratory</div> <div>Often Clears with Cough</div> | | <div>Acute Tracheobronchitis</div> <div>Chronic Obstructive Pulmonary Disease</div> | |
| Wheezes | Due to Localized Airway Narrowing (Tumor; Foreign Body, etc) or Generalized Airway Narrowing (Asthma, etc) | <div>Musical/Polyphonic</div> <div>High Frequency (≥ 400 Hz)</div> | Inspiratory and/or Expiratory | | <div>Asthma</div> <div>Chronic Obstructive Pulmonary Disease</div> | |
| Pleural Friction Rub | Due to Pleural Surface Friction | <div>Non-Musical</div> <div>Explosive</div> | <div>Typically Biphasic</div> <div>Basilar-Predominant</div> | Low Frequency (≤ 350 Hz) | <div>Pleural Inflammation</div> <div>Pleural Tumor</div> <div>Chest Tube</div> | |
| Squawk | Due to Distal Airways Disease | Mixed Sound with Short Musical Component (Short Wheeze) Preceded or Followed by Crackles | | Low Frequency (200-300 Hz) | Distal Airways Disease (Hypersensitivity Pneumonitis, Interstitial Lung Disease, Pneumonia) | |
| Stridor | Due to Upper Airway Obstruction | <div>Musical</div> <div>High Frequency (≥ 500 Hz)</div> | Loudest Over Anterior Neck (May Be Transmitted to the Trachea) | If Severe, May Be Heard Even without Stethoscope | <div>Extrathoracic (Vocal Cord Lesion, etc) or Intrathoracic (Tracheobronchomalacia, etc) Upper Airway Obstruction</div> <div>Fixed Upper Airway Obstruction (Bilateral Vocal Cord Paralysis, etc)</div> | |

| Lung Exam Findings by Disorder | | | | | | | | |
|--------------------------------|--|--|-----------------|---|--|---|---|--|
| Disorder | Breath Sounds | Crackles | Percussion | Vocal Fremitus (Say "99" or "Toy Boat" -> Auscultate) or Tactile Fremitus (Say "99" or "Scooby Doo" -> Palpate) | Whispered Pectoriloquy (Whisper "99" or "Slytherin Wizard" -> Auscultate) | Egophony (E-> A) (Say E -> Auscultate) | Tracheal Deviation | Other |
| 1 | Small Consolidation (Alveolar Filling) | Bronchovesicular/ Bronchial | Usually Present | Slightly Dull | Normal/ Increased | Variable | Present | Absent |
| | Large Consolidation (Alveolar Filling) | Bronchial | Present | Dull | Increased | Increased | Present | Absent |
| 2 | Small Pleural Effusion | Decreased | Absent | Dull | Decreased | Decreased | Absent | |
| | Large Pleural Effusion | Decreased (May Be Bronchial if Atelectasis is Also Present) | Absent | Dull (Hyperresonant Above Level of Fluid) | Decreased | Absent (May Be Present If Atelectasis is Also Present) | Absent (May Be Present If Atelectasis is Also Present) | Toward Contralateral Side |
| 3 | Emphysema | Decreased/ Absent | Variable | Hyperresonant | Decreased | Decreased/ Absent | Absent | Absent |
| 4 | Pneumothorax | Decreased/ Absent | Absent | Hyperresonant | Absent | Decreased/ Absent | Absent | Toward Ipsilateral Side Coin Sound (Bell Tympany) |
| 5 | Tension Pneumothorax | Decreased/ Absent | Absent | Hyperresonant | Absent | Decreased/ Absent | Absent | Toward Contralateral Side Coin Sound (Bell Tympany) |
| | Hydropneumothorax | Absent | Absent | Hyperresonant Above Fluid Level/ Dull Below Fluid Level | Absent | Absent | Absent (May Be Present if Atelectasis is Also Present) | Toward Contralateral Side Succussion Splash/ Shifting Dullness/ Coin Sound (Bell Tympany) |
| 6 | Atelectasis with Endobronchial Obstruction | Absent | Absent | Dull | Decreased | Absent | Absent | Toward Ipsilateral Side |
| | Consolidation with Endobronchial Obstruction | Decreased/ Absent | Absent | Dull | Decreased | Decreased/ Absent | Absent | Absent |
| 7 | Pleural Thickening | Decreased | Absent | Dull | Decreased | Decreased | Absent | Absent (Toward Ipsilateral Side in Severe Cases) |
| | Thick-Walled Cavity | Bronchovesicular/ Amphoric (Hollow, Low-Pitched) | Present | Slightly Dull | Normal/ Increased | Increased | Present | Absent |





Pleural Space Filled with

| | | |
|--------------------|--------|-------------------------------|
| Blood | Due to | Hemothorax |
| Transudative Fluid | Due to | Congestive Heart Failure, etc |
| Exudative Fluid | Due to | Parapneumonic Effusion, etc |
| Pus | Due to | Empyema |
| Chyle | Due to | Chylothorax |

Breath Sounds

Decreased

Egophony

Absent

Percussion

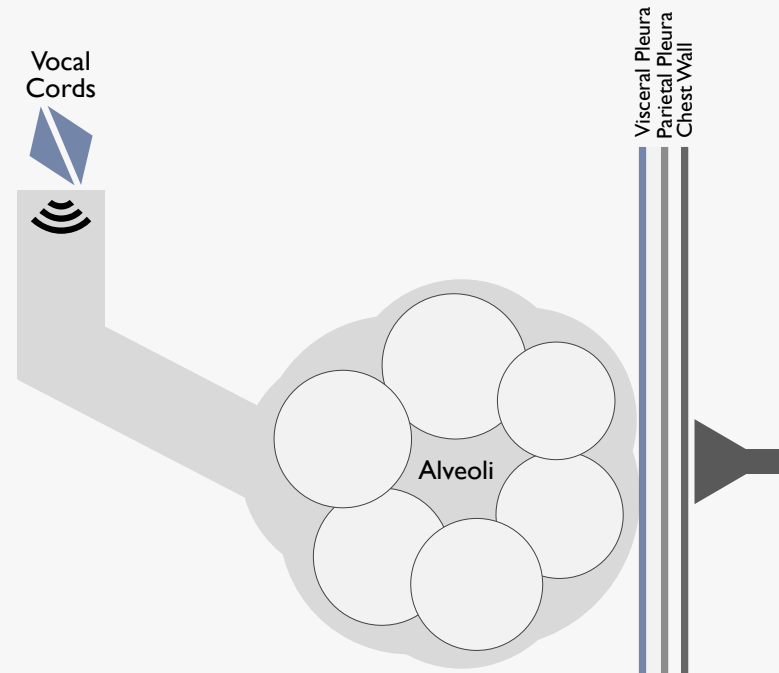
Dull

Tactile
Fremitus,
Vocal
Fremitus,
and
Whispered
Pectoriloquy

Decreased

Tracheal
Deviation

Toward
Contralateral Side
(Acute, Large
Effusion without
Associated
Atelectasis)



Emphysema Manifests Loss of Alveolar
Supporting Architecture
(with Decreased Density of the Lung)

Breath Sounds

Decreased

Egophony

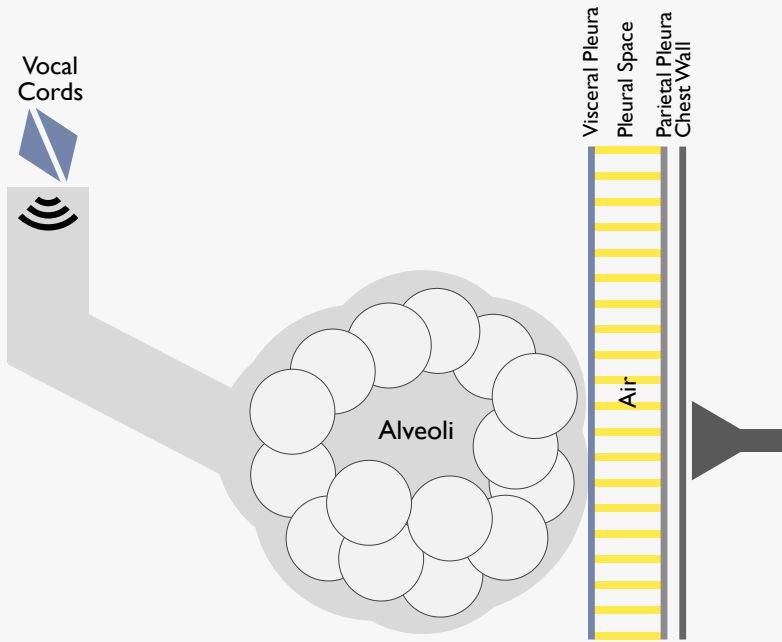
Absent

Percussion

Hyperresonant

Tactile
Fremitus,
Vocal
Fremitus,
and
Whispered
Pectoriloquy

Decreased



Atmospheric Pleural Space Pressure

Breath Sounds

Decreased

Egophony

Absent

Percussion

Hyperresonant

Tactile Fremitus, Vocal Fremitus, and Whispered Pectoriloquy

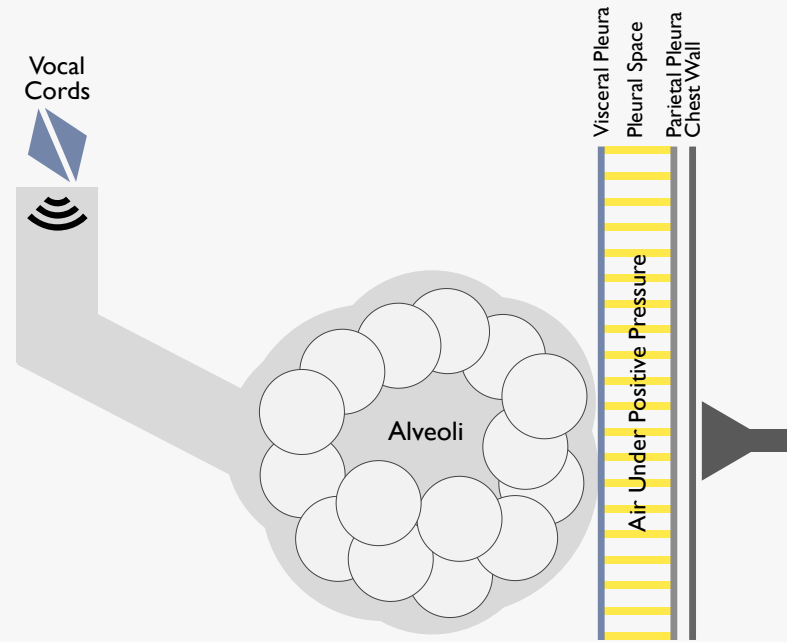
Absent

Tracheal Deviation

Toward Ipsilateral Side

Thoracic Ultrasound

Absent Lung Sliding/B-Lines



Positive Pleural Space Pressure

Breath Sounds

Decreased

Egophony

Absent

Percussion

Hyperresonant

Tactile Fremitus, Vocal Fremitus, and Whispered Pectoriloquy

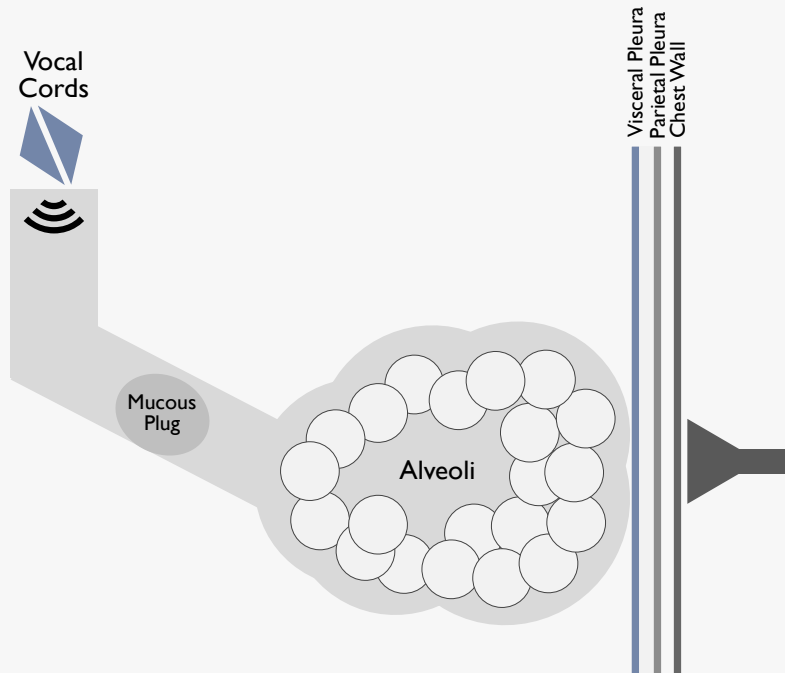
Absent

Tracheal Deviation

Toward Contralateral Side

Thoracic Ultrasound

Absent Lung Sliding/B-Lines



Breath Sounds

Absent

Egophony

Absent

Percussion

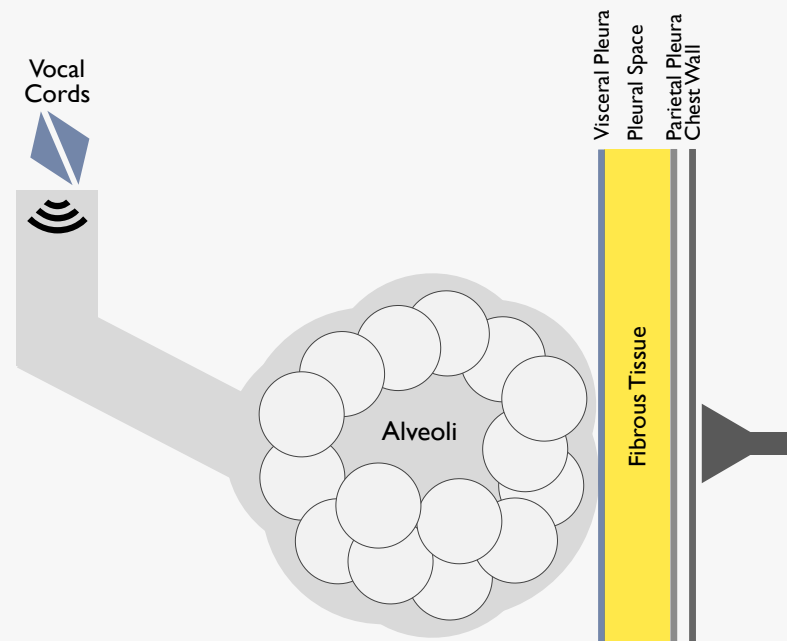
Dull

Tactile
Fremitus,
Vocal
Fremitus,
and
Whispered
Pectoriloquy

Decreased

Tracheal
Deviation

Toward
Ipsilateral Side



Breath Sounds

Decreased

Egophony

Absent

Percussion

Dull

Tactile
Fremitus,
Vocal
Fremitus,
and
Whispered
Pectoriloquy

Decreased