A review on pulmonary diseases

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ABSTRACT
Lung diseases or pulmonary diseases are some of the most common medical conditions in the world. Lung disease affecting Airways include asthma, chronic obstructive pulmonary disease. Lung disease affecting the air sacs include pneumonia, tuberculosis, pulmonary edema, lung cancer, acute respiratory distress syndrome, pneumoconiosis. Lung disease affecting the interstitium include interstitial lung disease. Lung diseases affecting blood vessels are pulmonary embolism, pulmonary hypertension. Lung disease affecting the pleura are pleural effusion, mesothelioma. Lung diseases affecting chest wall are obesity hypoventilation syndrome, neuromuscular disorder. Common symptoms include wheezing, shortness of breath, chest discomfort, cough with or without mucus, fever, blood in the sputum, weight loss, fatty stool. Diagnosis include pulmonary function test, chest imaging, thoracoscopy, needle biopsy pleura analysis, bronchoscopy, mediastinoscopy and mediastinotomy. Treatment for asthma, copd, pneumonia, bronchitis, include bronchodilators (salbutamol, theophylline), corticosteroids (hydrocortisone, prednisolone), antibiotics (amoxycillin, doxycycline, ciprofloxin, ceftriaxone) incase of tuberculosis medication include AKT3 & AKT4.

Keywords: Acute respiratory distress syndrome, Obesity hypoventilation syndrome, Thoracoscopy, mediastinoscopy, Mesothelium.

INTRODUCTION
Lung diseases or pulmonary diseases or pulmonary disorders refers to any disease or disorder in which the lungs do not function properly. These are some of the most common medical conditions in the world. Tens of millions of people suffer from lung disease. Smoking, infections, and genetics are responsible for most lung diseases.

Lung Diseases Affecting the Airways
Diseases that affect the airways include:

Asthma
It is an incurable illness of the airways. The disease causing inflammation & narrowing inside the lungs, restricting air supply. The symptoms of asthma often present in periodic attacks or episodes of tightness in the chest, wheezing, breathlessness, coughing.
Chronic obstructive pulmonary disease (COPD)

It is a progressive, irreversible inflammatory disease in lungs that makes it hard to breath. Symptoms include chronic cough, wheezing, production of phlegm, shortness of breath and feeling of tightness in the chest, though these symptoms may not be noticeable until the last stages of disease. Types include:

**Chronic bronchitis**

Bronchitis is an inflammation of the bronchial tubes. Symptoms include cough with mucus, low fever, chest tightness, shortness of breath.

**Emphysema**

It damages to the airsacs in the lungs. Symptoms include shortness of breath, cough. The most common cause is cigarette smoking.

**Acute bronchitis**

It is termed as inflammation of the bronchi of the lungs. Symptoms include cough with mucus, shortness of breath, chest discomfort, wheezing.

**Cystic fibrosis**

It is a genetic disorder that affects mostly the lungs. Symptoms include difficulty in breathing, poor growth, fatty stool.

LUNG DISEASES AFFECTING THE AIR SACS (ALVEOLI)

Lung diseases affecting the alveoli include:

**Pneumonia**

It is an inflammatory condition of the lungs affecting primarily the small air sacs known as alveoli. Symptoms include combination of productive or dry cough, chest pain, fever, trouble breathing, white nail syndrome.

**Tuberculosis**

It is an infectious disease caused by “Mycobacterium tuberculosis” bacteria mainly affecting the lungs. Symptoms include chronic cough, blood in th sputum, weight loss, fever.

**Pulmonary edema**

It a fluid accumulation in the tissue and air sacs of the lungs leading to impaired gas exchange & respiratory failure. Symptoms include difficulty in breathing, cough with blood, excessive sweating, anxiety, pale skin & orthopnea.

**Lung cancer**

It is a malignant lung tumor characterized by uncontrolled cell growth in the tissue of the lungs. Symptoms include coughing, weight loss, shortness of breath.

**Acute respiratory distress syndrome (ARDS)**

It is a type of respiratory failure characterized by rapid onset of widespread inflammation in the lungs. Symptoms include rapid breathing, bluish skin coloration.

**Pneumoconiosis**

It is an occupational lung disease caused by the inhalation of the dust especially in coal workers asbestosis and silicon mining. Patients with pneumoconiosis may have no symptoms in the early disease. Symptoms include cough with or without mucous ,chest tightness and shortness of breath.

LUNG DISEASES AFFECTING THE INTERSTITIUM

**Interstitial lung disease (ILD)**

A broad collection of lung conditions affecting the interstitium. Sarcoïdosis, idiopathic pulmonary fibrosis, and autoimmune disease are among the many types of ILD. Symptoms includes dry cough, shortness of breath, deformity of nails, weight loss.

LUNG DISEASES AFFECTING BLOOD VESSELS

**Pulmonary embolism (PE)**

A blood clot (usually in a deep leg vein, deep vein thrombosis) breaks off, travels to the heart, and is pumped into the lungs. The clot lodges in a pulmonary artery, often causing shortness of breath and low blood oxygen levels.

**Pulmonary hypertension**

Various conditions can lead to high blood pressure in the pulmonary arteries. This can cause shortness of breath and chest pain. When no cause is identified, the condition is called idiopathic pulmonary arterial hypertension.
Lung Diseases Affecting the Pleura

Lung diseases of the pleura include:

**Pleural effusion**

Fluid collects in the normally tiny pleura space between the lung and the chest wall. Pneumonia or heart failure is usually responsible. If large, pleural effusions can impair breathing, and should be drained.

**Pneumothorax**

Air may enter the space between the chest wall and the lung, collapsing the lung. Symptoms include pain in the chest, fast heart rate, low oxygen in the body & fast breathing.

**Mesothelioma**

A rare form of cancer that forms on the pleura. Mesothelioma tends to emerge several decades after asbestos exposure.

LUNG DISEASES AFFECTING THE CHEST WALL

**Obesity hypoventilation syndrome**

Extra weight on the chest and abdomen makes it difficult for the chest to expand. Serious breathing problems can result.

**Neuromuscular disorders**

Poor function in the nerves controlling the respiratory muscles causing difficulty in breathing. Amyotrophic lateral sclerosis and myasthenia gravis are examples of neuromuscular lung disease.

**Diagnosis**

- Arterial blood gas analysis
- Bronchoscopy
- Chest imaging (X-ray, MRI, CT scan)
- Chest tube insertion
- Needle biopsy of the pleura or lung
- Pulmonary function test
- Thoracoscopy
- Thoracotomy
- Suctioning
- Mediastinoscopy
- Mediastinotomy

TREATMENT

**Asthma Drugs Treatment**

![Asthma Drugs Treatment Diagram]
Chronic obstructive pulmonary disease

OTHER THERAPY INCLUDE

**Oxygen therapy**
- When symptoms become more severe, supplemental oxygen therapy may be needed. Thankfully there are now lightweight portable oxygen units that allow many people with COPD to live relatively active lives.

**Pulmonary rehabilitation**
- Just like rehabilitation for other ailments, pulmonary rehabilitation can make a big difference for some people living with COPD.

**Flu shots and pneumonia vaccine**
- These help prevent infection.

**Lung surgery**
- Three forms of surgery may be considered for severe COPD: Volume reduction surgery may be used to remove damaged lung tissue. Doctor may recommend a bullectomy, which is the removal of enlarged bullae in your lungs. In very severe COPD, lung transplantation may be recommended. Only a small percentage of COPD patients qualify for surgical intervention, however. While it can improve quality of life, it cannot prolong survival.

**Airway clearance techniques**
- These are techniques to clear mucus from your airway, including controlled coughing, chest physiotherapy, and using expectorants.

**Bronchitis**

**Antibiotics**
- Aminoglycosides, Macrolides, Cephalosporins.

**Antitussive**
- Codeine, Hydrocodone, Dextromethorphan

**Bronchodilators**
- \( \beta_2 \)-adrenergic agonist agents: Salbutamol, Terbutaline
- Anticholinergic agents: Ipatropium bromide
- Methylxanthines: Theophylline

**Mucolytics**
- Acetylcysteine

**Corticosteroids**
- Dexamethasone, Methylprednisolone, Defcort

**Other**
- Oxygen therapy, Pulmonary rehabilitation program, Chest physiotherapy, Nutritional therapy
**Pneumonia**

### Antibacterial treatment of pneumonia

| Community-acquired | **Streptococcus pneumoniae**<br>**Haemophilus influenzae** | **Mild, not previously treatment**<br>Oral amoxicillin 500mg–1g/8h or clarithromycin 500mg/12h or doxycycline 200mg loading then 100mg/day<br>**Moderate**<br>**Streptococcus pneumoniae**<br>**Haemophilus influenzae**<br>**Mycoplasma pneumoniae**<br>Oral amoxicillin 500mg–1g/8h + clarithromycin 500mg/12h or doxycycline 200mg loading then 100mg/12h.<br>**Severe**<br>As above<br>Co-amoxiclav 1.2g/8h IV or cephalosporin IV (eg cefuroxime 1.5g/8h IV) AND clarithromycin 500mg/12h IV. Add fluclouxacinif staph suspected; vancomycin (or teicoplanin) if MRSA suspected. Treat for 10d (14–21d if staph, legionella, or Gram −ve enteric bacteria suspected).<br>**Panton-Valentine Leukocidin-producing Staph. aureus (PVL-SA)** Consider adding IV linezolid, clindamycin, and rifampicin<br>**Atypical**<br>Legionella pneumophila<br>Chlamyphila species<br>Pneumocystis jiroveci | Fluoroquinolone combined with clarithromycin, or rifampicin, if severe.<br>Tetracycline<br>High-dose co-trimoxazole |

### Tuberculosis

<table>
<thead>
<tr>
<th>Resistance to</th>
<th><strong>Initial phase</strong></th>
<th><strong>Continuation phase</strong></th>
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<tbody>
<tr>
<td></td>
<td><strong>Drugs</strong></td>
<td><strong>Minimum duration in months</strong></td>
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<td>3</td>
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<tr>
<td></td>
<td>1. aminoglycoside</td>
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<tr>
<td></td>
<td>2. ethionamide</td>
<td>3</td>
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<tr>
<td></td>
<td>3. pyrazinamide</td>
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<td>4. ofloxacin</td>
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<tr>
<td></td>
<td>5. ethambutol</td>
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<td>3. pyrazinamide</td>
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<tr>
<td></td>
<td>4. ofloxacin</td>
<td>3</td>
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<tr>
<td></td>
<td>5. cycloserine</td>
<td>3</td>
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Drug induced pulmonary disease

<table>
<thead>
<tr>
<th>Class</th>
<th>Drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alkylating agents</td>
<td>Busulfan, chlorambucil, cyclophosphamide, ifosfamide, melphalan, procarbazine</td>
</tr>
<tr>
<td>Analgesics</td>
<td>Heroin, methadone, naloxone, nalorphin, propoxyphene, salicylates</td>
</tr>
<tr>
<td>Antibiotics</td>
<td>Ampicillin, B. cephalosporins, ciprofloxacin, clindamycin, daptomycin, erythromycin, minocycline, nitrofurantoin, penicillin, pentamidine, sulfadiazine, sulfonamides</td>
</tr>
<tr>
<td>Antiepileptics</td>
<td>Carbamazepine, phenytoin</td>
</tr>
<tr>
<td>Antidepressants</td>
<td>Bupropion, cilazapram, duloxetine, tricyclics, venlafaxine</td>
</tr>
<tr>
<td>Antidiabetics</td>
<td>Thiazolidinediones, pioglitazone, rosiglitazone</td>
</tr>
<tr>
<td>Anti-inflammatory agents</td>
<td>Acetylsalicylic acid, colchicine, gold, meloxicam, methylprednisolone, NSAIDs, plicillamine</td>
</tr>
<tr>
<td>Antimitobalities</td>
<td>Azathioprine, cladribine, cytarabine, mercaptopurine, methotrexate</td>
</tr>
<tr>
<td>Biological response modifiers</td>
<td>Adalimumab, etanercept, granulocyte colony-stimulating factor, interleukin-2, infliximab, interferons, leflunomide, lenalidomide, thalidomide, tumor necrosis factor</td>
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<tr>
<td>Bone resorption inhibitors</td>
<td>Pemidronate, risedronate</td>
</tr>
<tr>
<td>Cardiovascular agents</td>
<td>Amiodarone, ACE inhibitors, anticoagulants, beta-blockers, carvedilol, dipyridamole, diltiazem, fibrinolitics, nicardipine, propafenone, propranolol, statins, tocolide</td>
</tr>
<tr>
<td>Chemotherapeutic cytotoxic agents</td>
<td>Actinomycin D, bleomycin, doxorubicin, etoposide, mitomycin, neocarzinostatin, trastuzumab</td>
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<tr>
<td>Hormones</td>
<td>Oral contraceptives, progesterone</td>
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<tr>
<td>Immunoreactives</td>
<td>Corticosteroids, interleukin-2</td>
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<tr>
<td>Inflamnals</td>
<td>Aspirated oil, oxygen</td>
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<tr>
<td>Intravenous</td>
<td>Blood, ethidol, fluid fat emulsion, montmoruinitate sodium, taic</td>
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<tr>
<td>Nitrosoxrease</td>
<td>Carmustine, lomustine, nimustine</td>
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<tr>
<td>Plant alkaloids</td>
<td>Etoposide, teniposide, pacitaxel, vinblastine, vincristine</td>
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<tr>
<td>Platelet-aggregation inhibitors</td>
<td>Clopidogrel, ticlopidine, thienoban</td>
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<tr>
<td>Prostaglandins</td>
<td>Epoprostenol, prostaglandin E1</td>
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<tr>
<td>Radiation</td>
<td>Acute, chronic</td>
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<tr>
<td>SERMs</td>
<td>Raloxifene, tamoxifen</td>
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<tr>
<td>Skeletal muscle relaxants</td>
<td>Danzitrenene, tizanidine</td>
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<tr>
<td>Miscellaneous</td>
<td>Benzacine, brocnoine, chlorhexidine, cyclosporine A, factor VII, getulin, hydrochlorothiazide, L-tryptophan, leucotrienes, methimazole, naphazoline, onaprazole, oxybutin, quinine, rituxin, seiruline, sufinilin, tocolcytes, triptans</td>
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ACE: angiotensin-converting enzyme; NSAIDs: nonsteroidal anti-inflammatory drugs; SERMs: selective estrogen receptor modulators.

REFERENCES


