

Pulmonary Conditions: Diagnosis and Management

We are seeking an author or author group to write a manuscript for this edition of *FP Essentials* on the diagnosis and management of pulmonary conditions. This edition will cover four topics:

- Asthma
- Chronic Obstructive Pulmonary Disease
- Restrictive and Interstitial Lung Disease
- Pulmonary Embolism and Venous Thromboembolism

The main text of the manuscript should be approximately 10,000 words in length, divided into four sections of approximately 2,500 words each, plus an abstract of approximately 200 words for each section. In addition, there should be key practice recommendations, a maximum of 15 tables/figures total, and up to 200 references to provide support for all recommendations and factual statements in the manuscript. References must be numbered sequentially by section, with each new section starting over at “1.”

This edition should focus on what is new in each topic and should answer the key questions listed for each section. Each section should begin with an illustrative case, similar to the examples provided, with modifications to emphasize key points; each case should have a conclusion that demonstrates resolution of the clinical situation. The references provided here include information that should be considered in preparation of this edition of *FP Essentials*. However, these should be used only as a starting point in identifying the most current guidelines and references to include in the edition.

Needs Assessment

Family physicians encounter many patients with pulmonary symptoms and disorders in both the outpatient and inpatient settings. Classification of asthma and both chronic obstructive and restrictive pulmonary diseases continue to confuse clinicians with regard to appropriate diagnostic, treatment, and follow-up paradigms. Novel diagnostic guidelines, biomarkers, and treatment strategies are available for these conditions, as well as for pulmonary embolism and venous thromboembolic disease that can minimize morbidity and mortality. Surveys of family physicians and residents consistently identify gaps in knowledge and confidence in managing these often complex conditions. This edition of *FP Essentials* will provide family physicians with an update on the most current and evidence-based approaches to the diagnosis and management of these common and prevalent pulmonary conditions.

Section 1: Asthma

Example Case

IA is a 14-year-old with asthma who presents with increasing shortness of breath and wheezing both at rest and with activity. His mother states that over the past week he has been coughing at night while he sleeps. He denies any upper respiratory tract infection symptoms, fevers, chills, recent travel, or exposure to anyone who has been ill. During soccer practice he has been experiencing some chest tightness and increased wheezing, so he uses his rescue inhaler, but feels it isn't working as well as it used to. He has moderate second-hand smoke exposure but has never smoked or vaped. It is spring, so pollen levels are currently elevated.

Key Questions to Consider

Epidemiology and Pathophysiology

- How common is asthma in children and adults? What are the national and global burdens of disease with respect to incidence, prevalence, and healthcare expenditures?
- What pathophysiologic, genetic, environmental, and social factors increase risk of development of asthma in children and adults and are associated with worse outcomes for those with asthma?
- What role does the “hygiene hypothesis” play in the risk of developing asthma? What about the role of breastfeeding for the risk of developing asthma in childhood?

Clinical Presentation and Diagnosis

- What are the common presenting signs and symptoms of asthma? At what age does asthma typically present?
- What is the differential diagnosis of the patient who presents with wheezing and dyspnea (with or without exertion)? What is the relationship between preschool-age wheezing and asthma?
- How often is asthma under-diagnosed? What diagnoses are commonly mistaken for asthma?
- How often is asthma over-diagnosed? What diagnoses are commonly missed?
- What are the common physical examination findings in a patient with asthma (at baseline, during an acute exacerbation)? Include findings for all relevant organ systems.
- What are the current evidence- and guideline-based diagnostic and classification criteria for asthma?
- Which laboratory and radiographic tests are recommended for evaluating patients with asthma (at time of diagnosis, during exacerbations, after resolution of symptoms)? What are the specific clinical thresholds utilizing peripheral blood eosinophil counts in escalating to targeted oral therapies?
- When should a patient with suspected and/or diagnosed asthma have spirometry or be referred for pulmonary function tests? What are the common, expected, and concerning results seen on these tests?
- What are the pros and cons of using pulse oximetry, peak flow meters, and spirometry for patients with asthma?
- What is the role of biomarkers in diagnosis and follow-up evaluation?

Treatment

- What are the current evidence- and guideline-based pharmacologic and non-pharmacologic treatment strategies, based upon classification and severity? Describe the

adverse effects of asthma medications. Consider adding a table comparing the different inhalers and asthma medications to clarify this for readers.

- When can a patient with an asthma exacerbation be safely monitored and treated at home? When should inhaled or oral corticosteroids or other treatments be prescribed prior to evaluating the patient? When should biologics be considered?
- When should a patient with an asthma exacerbation be referred for emergent medical evaluation? Which patients should be admitted to the hospital?
- What is the relationship between medical and psychological comorbidities and adherence to treatment?
- What lifestyle modifications have demonstrated proven benefit in improving outcomes in asthma?
- When should a patient be referred to a pulmonologist for evaluation and treatment of asthma?

Prognosis

- For children, describe the value of asthma screening tools such as the Asthma Predictive Index or the Pediatric Asthma Risk Score.
- How effective are the various pharmacologic and non-pharmacologic strategies for treating asthma?
- How is therapeutic response to medication best monitored?
- How effective are asthma action plans and step-up/step-down therapy in preventing exacerbations, to include ER visits and hospitalizations?
- Which patients are most likely to have poorly controlled asthma and frequent exacerbations? Which patients are most likely to require emergent medical evaluation?
- What is the role of ambulatory care pharmacists in the management of asthma? Have they been proven to be effective in improving practice quality metrics? What is the role of respiratory therapists in the outpatient setting?
- What is the role of school-based clinics in the management of asthma? How effective are they at preventing exacerbations, to include ER visits and hospitalizations?
- What is the role of community paramedic programs in the management of asthma? How effective are they in preventing exacerbations, to include ER visits and hospitalizations?
- What are the roles of telehealth and AI in asthma management? How effective are they in preventing exacerbations, to include ER visits and hospitalizations?

Initial References to Consider

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Section 2: Chronic Obstructive Pulmonary Disease

Example Case

CM is a 69-year-old with a past medical history of hypertension, Class 1 obesity, and a 50+ pack-year history of tobacco use who presents with progressive dyspnea on exertion and a chronic cough productive of thick whitish sputum. He denies fevers, chills, night sweats, weight loss, recent illness, or exposure to anyone who has been ill. Lung auscultation reveals diminished breath sounds bilaterally with scattered expiratory wheezes and a prolonged expiratory phase. Cardiac examination is unremarkable, and no peripheral edema or clubbing is noted.

Key Questions to Consider

Epidemiology and Pathophysiology

- How common is chronic obstructive pulmonary disease (COPD)? What are the national and global burden of disease with respect to incidence, prevalence, and healthcare expenditures?
- What pathophysiologic, genetic, environmental, and social factors increase the risk of developing COPD?

Clinical Presentation and Diagnosis

- What are the common presenting signs and symptoms of COPD? *Consider creating a chart comparing the differences between GOLD 2025 vs 2026 in the diagnosis, assessment, and treatment of COPD.*
- What is the differential diagnosis of the patient who presents with dyspnea (with or without exertion) and chronic cough?
- How often is COPD under-diagnosed? What diagnoses are commonly mistaken for COPD?
- How often is COPD over-diagnosed? What diagnoses are commonly missed?
- What are the common physical examination findings in a patient with COPD (at baseline, during an acute exacerbation)? Include findings for all relevant organ systems.
- What are the current evidence- and guideline-based diagnostic and classification criteria for COPD? What are the criteria for distinguishing acute COPD exacerbation from chronic COPD symptoms?
- What laboratory and radiographic tests are recommended for evaluating patients with COPD (at time of diagnosis, during exacerbations, after resolution of symptoms)?
- When should a patient with suspected and/or diagnosed COPD undergo spirometry or be referred for pulmonary function tests? What are the common, expected, and concerning results seen on these tests?
- What is the role of biomarkers in diagnosis and follow-up evaluation?

Treatment

- What are the current evidence- and guideline-based pharmacologic and non-pharmacologic treatment strategies, based upon classification and severity? Describe the adverse effects of COPD medications. What are the role of biologics, such as dupilumab and mepolizumab in COPD treatment? How has the Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2026 report changed COPD management?
- When can a patient with a COPD exacerbation be safely monitored and treated at home?
- When should corticosteroids or other treatments be prescribed without evaluating the patient?

- When should a patient with a COPD exacerbation be referred for emergent medical evaluation? When should a patient with a COPD exacerbation be admitted to the hospital?
- What is the relationship between medical and psychological comorbidities and adherence to treatment?
- What lifestyle modifications have demonstrated proven benefit in improving outcomes in COPD?
- When should a patient be referred to a pulmonologist for evaluation and treatment of COPD? When should a patient with COPD be referred to a pulmonary rehabilitation program?

Prognosis

- How effective are the various pharmacologic and non-pharmacologic strategies for treating COPD?
- How is therapeutic response to medication best monitored?
- How effective is step-up/step-down therapy in preventing exacerbations, to include ER visits and hospitalizations?
- Which patients are most likely to have poorly controlled COPD and frequent exacerbations? Which patients are most likely to require emergent medical evaluation?
- What is the role of ambulatory care pharmacists in the management of COPD? Have they been proven to be effective in improving practice quality metrics? What is the role of respiratory therapists in the management of COPD in the outpatient setting?
- What is the role of community paramedic programs in the management of COPD? How effective are they in preventing exacerbations, to include ER visits and hospitalizations?
- What are the roles of telehealth and AI in COPD management? How effective are they in preventing exacerbations, to include ER visits and hospitalizations?

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Section 3: Restrictive and Interstitial Lung Disease

Example Case

LO is a 62-year-old who presents with a history of progressive dyspnea on exertion over the past several months. She has had a persistent non-productive cough, but denies any upper respiratory tract infection symptoms, fevers, chills, weight loss, night sweats, recent travel, or exposure to anyone who has been ill. She has never smoked tobacco or marijuana. Recently, she went to an urgent care for evaluation of dyspnea, and the chest radiograph revealed “infiltrates, but no evidence of pneumonia or acute cardiopulmonary disease.”

Key Questions to Consider

Epidemiology and Pathophysiology

- Define and describe restrictive lung disease (RLD) and interstitial lung disease (ILD). How common are they? What are the national and global burdens of disease with respect to incidence, prevalence, and healthcare expenditures?
- What pathophysiologic, genetic, and environmental and social factors increase risk of development of RLD and ILD? What medications, medical treatments, and medical conditions are associated with RLD and ILD? *Consider using a table.*

Clinical Presentation and Diagnosis

- What are the common presenting signs and symptoms of RLD and ILD?
- What is the differential diagnosis of the patient who presents with dyspnea (with or without exertion) and chronic cough?
- How often are RLD and ILD under-diagnosed? What diagnoses are commonly mistaken for them?
- How often are RLD and ILD over-diagnosed? What diagnoses are commonly missed?
- What are the common physical examination findings in a patient with RLD or ILD (at baseline, during an acute exacerbation)? Include findings for all relevant organ systems.
- What are the current evidence- and guideline-based diagnostic and classification criteria for RLD and ILD? When is a 6-minute walk test recommended?
- What laboratory and radiographic tests are recommended for evaluating patients with RLD and ILD for diagnosis (at time of diagnosis, during exacerbations, after resolution of symptoms) and exclusion of other diseases?
- When should a patient with suspected and/or diagnosed RLD or ILD undergo pulmonary function tests? What type of PFTs should be ordered? Why is DLCO important? What are the common, expected, and concerning results seen on these tests?
- What is the role of biomarkers in diagnosis and follow-up evaluation?

Treatment

- What are the current evidence- and guideline-based pharmacologic and non-pharmacologic treatment strategies, based upon classification and severity? Describe the adverse effects of RLD and ILD medications and monitoring requirements. *Consider creating a table.*
- When should home oxygen therapy be initiated? What are the SpO₂ targets?
- When can a patient with an RLD or ILD exacerbation be safely monitored and treated at home? When should corticosteroids or other treatments be prescribed without evaluating the patient?
- When should a patient with an RLD or ILD exacerbation be referred for emergent medical evaluation?

- What is the relationship between medical and psychological comorbidities and adherence to treatment?
- What lifestyle modifications have demonstrated proven benefit in improving outcomes in RLD and ILD?
- When should a patient be referred to a pulmonologist or pulmonary rehabilitation, or lung transplant center for evaluation and treatment of RLD or ILD?

Prognosis

- How effective are the various pharmacologic and non-pharmacologic strategies for treating RLD and ILD?
- How is therapeutic response to medication best monitored?
- How effective is step-up/step-down therapy in preventing exacerbations, to include ER visits and hospitalizations?
- Which patients are most likely to have poorly controlled RLD or ILD and frequent exacerbations? Which patients are most likely to require emergent medical evaluation?
- What is the role of ambulatory care pharmacists in the management of RLD and ILD?
- What are the roles of telehealth and AI in RLD and ILD management? How effective are they in preventing exacerbations, to include ER visits and hospitalizations?

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Section 4: Pulmonary Embolism and Venous Thromboembolism

Example Case

RG is a healthy 31-year-old with no significant past medical history who presents with a several day history of right calf pain, right-sided chest pain, and increasing shortness of breath on exertion. They were recently on vacation and spent the week hiking at elevation. They deny any trauma or falls. They do not currently take any medications or supplements, and deny tobacco/nicotine, alcohol, or illicit/intravenous drug use and only occasionally use marijuana. They have no known family history of clotting disorder.

Key Questions to Consider

Epidemiology and Pathophysiology

- How common are pulmonary embolism (PE) and venous thromboembolism (VTE)? What are the national and global burden of disease with respect to incidence, prevalence, and healthcare expenditures?
- What pathophysiologic, genetic, environmental, and social factors increase risk of development of PE and VTE?
- How has COVID changed the epidemiology, pathophysiology, and management of PE and VTE?

Clinical Presentation and Diagnosis

- What are the common presenting signs and symptoms of PE and VTE?
- What is the differential diagnosis of the patient who presents with dyspnea (with or without exertion), chest pain, and leg pain?
- How often are PE and VTE under-diagnosed? What diagnoses are commonly mistaken for them?
- What are the common physical examination findings in a patient with PE and VTE (at baseline, during an acute exacerbation)? Include findings for all relevant organ systems.
- What are the current evidence- and guideline-based diagnostic and classification criteria for PE and VTE?
- What is the role of clinical decision tools (eg, Wells score, PERC) for informing decisions about further testing or evaluation and how accurate are they?
- What laboratory and radiographic tests are recommended for evaluating patients with PE and VTE (at time of diagnosis, after resolution of symptoms)? Specifically, what hematologic studies should be obtained at time of diagnosis, prior to or after anticoagulation? When is echocardiography indicated? When is COVID testing indicated?
- What additional tests should be performed on a patient with a newly diagnosed PE and/or VTE? What are the common, expected, and concerning results seen on these tests?
- What is the role of biomarkers in diagnosis and follow-up evaluation?

Treatment

- What are the current evidence- and guideline-based pharmacologic and non-pharmacologic treatment strategies, based upon classification and severity? Describe the adverse effects of PE and VTE medications.
- When can a patient with a newly diagnosed PE and/or VTE be safely monitored and treated at home, without requiring ER evaluation and monitoring, and hospitalization? What risk assessment scoring tools (eg, PESI, Hestia) are recommended?

- What are the indications for hospitalization? What are the indications for advanced therapies such as catheter-directed thrombolysis, systemic thrombolysis, mechanical thrombectomy, and surgical embolectomy?
- What lifestyle modifications have demonstrated proven benefit in preventing and improving outcomes in PE and VTE?
- How long is anticoagulation recommended after the first event of a PE or VTE?
- How long is anticoagulation recommended after subsequent events?
- When are heparin/low-molecular-weight heparin (eg, critical illness, pregnancy, breastfeeding) and/or vitamin K antagonists (eg, antiphospholipid antibody syndrome) preferred over direct oral anticoagulants? When should direct thrombin inhibitors, such as dabigatran, be used? How do anticoagulants compare in terms of efficacy, cost, side effects? *Consider creating a table.*
- How effective are non-pharmacologic strategies for treating PE and VTE?
- When is low-dose anticoagulation recommended after a PE or VTE?
- In which patients do the risks of anticoagulation outweigh the potential benefits?
- When should a patient be referred to a pulmonologist, hematologist, or vascular surgeon for evaluation and treatment of PE and/or VTE?

Prognosis

- How is therapeutic response to medication best monitored?
- Should patients have follow-up radiographic imaging to ensure resolution of emboli? If so, when and why?
- What other complications from PE and VTE can occur? How should patients be effectively monitored?
- What is the role of pharmacy and anticoagulation services in the follow-up management of PE and/or VTE?

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