

A SELECTION OF TEN CURRENT READINGS ON TOPICS RELATED TO UPDATE IN ASTHMA MANAGEMENT

Some available as free full-text and some requiring payment

Selection of readings made by A/Prof Goh Lee Gan

READING 1 – ASTHMA MIMICS IN EMERGENCY MEDICINE

Kann K(1), Long B(1), Koyfman A(2). Clinical Mimics: An Emergency Medicine-Focused Review of Asthma Mimics. J Emerg Med. 2017 Aug;53(2):195-201.

PubMed PMID: 28233608[Payment required].

Author information:

(1)Department of Emergency Medicine, San Antonio Military Medical Center, Fort Sam Houston, Texas. (2)Department of Emergency Medicine, The University of Texas Southwestern Medical Center, Dallas, Texas.

ABSTRACT

BACKGROUND: Asthma is a common diagnosis or preexisting condition, and many patients with acute asthma exacerbation may present to the emergency department with wheezing and respiratory distress. However, many conditions may mimic this presentation.

OBJECTIVES: This review provides an overview of common asthma mimics and an approach to evaluation and management.

DISCUSSION: Asthma is characterized by an obstructive pulmonary disease with recurrent exacerbations. The disease may present with a variety of symptoms, including wheezing, chest tightness, shortness of breath, and even respiratory failure. Mimics include anaphylaxis, angioedema, central airway obstruction, heart failure, allergic reaction, foreign body aspiration, pulmonary embolism, and vocal cord dysfunction. The approach to evaluation and management of these patients includes assessment for life-threatening conditions while treatment and resuscitation is underway. Providers should assess for red flags, including no history of asthma, lack of severe asthma, and no improvement with standard treatments. Focused assessment with history, physical examination, chest imaging, electrocardiogram, and laboratory studies may provide benefit. Through consideration of these mimics and treatment, providers can provide rapid management.

CONCLUSIONS: While asthma is a common disease, many asthma mimics exist. Through consideration of other diseases with wheezing and assessing for red flags, such as patients presenting without a history of asthma or patients with a history of only mild asthma presenting with severe symptoms, emergency providers may decrease the chance of early diagnostic closure and anchoring while improving the care of these patients.

READING 2 – ASTHMA IN OLDER ADULTS

Yawn BP(1), Han MK(2). Practical Considerations for the Diagnosis and Management of Asthma in Older Adults. Mayo Clin Proc. 2017 Nov;92(11):1697-1705.

PubMed PMID: 29101938 [Free full text].

Author information:

(1)Department of Family Medicine and Community Health, University of Minnesota, Blaine, MN. Electronic address: byawn47@gmail.com. (2)Women's Respiratory Clinic, Division of Pulmonary and Critical Care Medicine, University of Michigan Health System, Ann Arbor, MI.

ABSTRACT

Although often considered a disease of childhood, the prevalence of asthma in US adults aged 65 years or older is similar to that in children, with the number of older patients needing care for asthma likely to continue to increase. As with most chronic diseases, there are challenges associated with the diagnosis and management of asthma in an older population.

This review discusses these challenges, suggesting practical management strategies for primary care physicians and their teams.

Asthma comprises a spectrum of phenotypes, some associated with adult onset. The symptoms and characteristics of patients with late-onset asthma can differ from those of patients with early-onset disease. Furthermore, older patients may fail to recognize respiratory symptoms as abnormal and have other comorbidities, complicating the differential diagnosis of asthma. Once diagnosed, the long-term goals of asthma management are no different in older adults than in anyone with asthma, with inhaled corticosteroids being the cornerstone of therapy. Comorbid conditions become more common with age and have a direct impact on a patient's respiratory symptoms and potential adverse effects of therapy, thereby influencing the choice of therapies and delivery systems and potentially increasing the likelihood of complex polypharmacy.

In conclusion, asthma, although traditionally considered a disease of the young, should be considered as a potential diagnosis in older adults with respiratory symptoms, even without a history of asthma or allergies. As with all patients, the primary goals of asthma management in older adults are symptom control and exacerbation reduction.

READING 3 – DIAGNOSIS AND MANAGEMENT OF ASTHMA IN ADULTS

McCracken JL(1), Veeranki SP(2), Ameredes BT(3), Calhoun WJ(1)(3). Diagnosis and Management of Asthma in Adults: A Review. JAMA. 2017 Jul 18;318(3):279-290. Erratum in: JAMA. 2017 Oct 24;318(16):1615. Dosage error in article text.

PubMed PMID: 28719697[Payment required].

Author information:

(1)Division of Allergy and Clinical Immunology, University of Texas Medical Branch, Galveston. (2)Department of Preventive Medicine and Community Health, University of Texas Medical Branch, Galveston. (3)Division of Pulmonary Critical Care and Sleep, Department of Internal Medicine, University of Texas Medical Branch, Galveston.

Erratum in: JAMA. 2017 Oct 24;318(16):1615. Dosage error in article text.

ABSTRACT

Importance: Asthma affects about 7.5% of the adult population. Evidence-based diagnosis, monitoring, and treatment can improve functioning and quality of life in adult patients with asthma.

Observations: Asthma is a heterogeneous clinical syndrome primarily affecting the lower respiratory tract, characterized by episodic or persistent symptoms of wheezing, dyspnea, and cough. The diagnosis of asthma requires these symptoms and demonstration of reversible airway obstruction using spirometry. Identifying clinically important allergen sensitivities is useful. Inhaled short-acting β_2 -agonists provide rapid relief of acute symptoms, but maintenance with daily inhaled corticosteroids is the standard of care for persistent asthma. Combination therapy, including inhaled corticosteroids and long-acting β_2 -agonists, is effective in patients for whom inhaled corticosteroids alone are insufficient. The use of inhaled long-acting β_2 -agonists alone is not appropriate. Other controller approaches include long-acting muscarinic antagonists (eg, tiotropium), and biological agents directed against proteins involved in the pathogenesis of asthma (eg, omalizumab, mepolizumab, reslizumab).

Conclusions and Relevance: Asthma is characterized by variable airway obstruction, airway hyperresponsiveness, and airway inflammation. Management of persistent asthma requires avoidance of aggravating environmental factors, use of short-acting β_2 -agonists for rapid relief of symptoms, and daily use of inhaled corticosteroids. Other controller medications, such as long-acting bronchodilators and biologics, may be required in moderate and severe asthma. Patients with severe asthma generally benefit from consultation with an asthma specialist for consideration of additional treatment, including injectable biologic agents.

READING 4 – SEVERE ASTHMA PHENOTYPES

Fitzpatrick AM(1), Moore WC(2). Severe Asthma Phenotypes - How Should They Guide Evaluation and Treatment? J Allergy Clin Immunol Pract. 2017 Jul - Aug;5(4):901-908.

PubMed PMID: 28689840[Free full text].

Author information:

(1)Department of Pediatrics, Emory University, Atlanta, Ga. (2)Section on Pulmonary, Critical Care, Allergy and Immunologic Diseases, Department of Internal Medicine, Wake Forest School of Medicine, Winston-Salem, NC. Electronic address: wmoore@wakehealth.edu.

ABSTRACT

Although patients with "severe" asthma tend to be characterized by ongoing symptoms and airway inflammation despite treatment with high doses of inhaled and systemic corticosteroids, there is increasing recognition of marked phenotypic heterogeneity within affected patients.

Although "precision medicine" approaches for patients with severe asthma are needed, there are many hurdles that must be overcome in daily practice. The National Heart, Lung and Blood Institute's Severe Asthma Research Program (SARP) has been at the forefront of phenotype discovery in severe asthma for the past decade. SARP, along with other international groups, has described clinical severe asthma phenotypes in both adults and children that can be evaluated in the clinical setting. Although these clinical phenotypes provide a good "starting point" for addressing disease heterogeneity in severe asthma in everyday practice, more efforts are needed to understand how these phenotypes relate to underlying disease mechanisms and pharmacological treatment responses.

This review highlights the clinical asthma phenotypes identified to date, their associations with underlying endotypes and potential biomarkers, and remaining knowledge gaps that must be addressed before precision medicine can become a reality for patients with severe asthma.

READING 5 – ASTHMA IN ADOLESCENTS

de Benedictis D(1), Bush A(1)(2)(3)(4). Asthma in adolescence: Is there any news? Pediatr Pulmonol. 2017 Jan;52(1):129-138.

PubMed PMID: 27273858[Free full text].

Author information:

(1)Department of Mother and Child Health, Azienda Ospedaliera, Perugia, Italy. (2)Department of Pediatrics, Imperial College, London, UK. (3)Department of Pediatric Respiratory Medicine, National Heart and Lung Institute, London, UK. (4)Department of Pediatric Respiratory Medicine, Royal Brompton and Harefield NHS Foundation Trust, London, UK.

ABSTRACT

Asthma is a chronic disease that has a significant impact quality of life, which is particularly important in adolescence. We will discuss aspects of epidemiology, the clinical spectrum, diagnostics, and management of asthma in adolescence. In particular, we will highlight the psychological implications of having asthma during this developmental period.

Data published in the past 10 years, since we last reviewed the subject, will be the main focus of this paper. The care of the teenager with asthma should take into account the rapid physical, emotional, cognitive, and social changes that occur during normal adolescence.

The diagnostic process may be more difficult since teenagers tend to deny their illness. Thus, both under-diagnosis and under-assessment of asthma severity may lead to under-treatment and potentially avoidable morbidity and even mortality.

Conversely, teenagers may be often misdiagnosed as having asthma or their asthma severity may be overestimated leading to inappropriate and sometimes excessive treatment.

Educational programs, environmental avoidance measures, proper use of medications along with a skilled approach, and a caring attitude of health providers are all very important for successful management.

READING 6 – CLINICAL TOOLS TO ASSESS ASTHMA CONTROL IN CHILDREN

Dinakar C, Chipps BE; SECTION ON ALLERGY AND IMMUNOLOGY; SECTION ON PEDIATRIC PULMONOLOGY AND SLEEP MEDICINE. Clinical Tools to Assess Asthma Control in Children. *Pediatrics*. 2017 Jan;139(1). pii: e20163438.

PubMed PMID: 28025241 [Free full text].

Collaborators: Matsui EC, Abramson SL, Dinakar C, Irani AM, Kim JS, Mahr TA, Pistiner M, Wang J, Katkin JP, Van Hook KN, Brooks LJ, Hudak BB, Kravitz RM, Paranjape S, Schechter MS, Sharma GD, Stokes DC.

ABSTRACT

Asthma affects an estimated 7 million children and causes significant health care and disease burden. The most recent iteration of the National Heart, Lung and Blood Institute asthma guidelines, the Expert Panel Report 3, emphasizes the assessment and monitoring of asthma control in the management of asthma.

Asthma control refers to the degree to which the manifestations of asthma are minimized by therapeutic interventions and the goals of therapy are met. Although assessment of asthma severity is used to guide initiation of therapy, monitoring of asthma control helps determine whether therapy should be maintained or adjusted.

The nuances of estimation of asthma control include understanding concepts of current impairment and future risk and incorporating their measurement into clinical practice. Impairment is assessed on the basis of frequency and intensity of symptoms, variations in lung function, and limitations of daily activities. "Risk" refers to the likelihood of exacerbations, progressive loss of lung function, or adverse effects from medications.

Currently available ambulatory tools to measure asthma control range are subjective measures, such as patient-reported composite asthma control score instruments or objective measures of lung function, airway hyperreactivity, and biomarkers.

Because asthma control exhibits short- and long-term variability, health care providers need to be vigilant regarding the fluctuations in the factors that can create discordance between subjective and objective assessment of asthma control.

Familiarity with the properties, application, and relative value of these measures will enable health care providers to choose the optimal set of measures that will adhere to national standards of care and ensure delivery of high-quality care customized to their patients.

READING 7 – ACUTE ASTHMA, PROGNOSIS AND TREATMENT

Ferguson JE(1), Patel SS(2), Lockey RF(2). Acute asthma, prognosis, and treatment. J Allergy Clin Immunol. 2017 Feb;139(2):438-447.

PubMed PMID: 2755481 | [Payment required].

Author information:

(1)Department of Internal Medicine, Division of Allergy and Immunology, University of South Florida, Tampa, Fla. Electronic address: jfergeso@health.usf.edu. (2)Department of Internal Medicine, Division of Allergy and Immunology, University of South Florida, Tampa, Fla.

ABSTRACT

Asthma affects about 300 million people globally and accounts for 1 in every 250 deaths in the world.

Approximately 12 million people in the United States each year experience an acute exacerbation of their asthma, a quarter of which require hospitalization. Acute asthma should be differentiated from poor asthma control. Patients with acute asthma will exhibit increasing shortness of breath, chest tightness, coughing, and/or wheezing. In contrast, poor asthma control typically presents with a diurnal variability in airflow and is a characteristic that is usually not seen during an acute exacerbation.

The history should include a review of comorbidities, adherence to medications, previous episodes of near-fatal asthma, and whether the patient has experienced multiple emergency department visits or hospitalizations, particularly those requiring admission to an intensive care unit involving respiratory failure, intubation, and mechanical ventilation.

Patient education is important to ensure that the patient understands that asthma is mostly a chronic disease and necessitates the avoidance of allergens, prevention of infections, adherence with routine vaccinations, management of comorbid conditions, and adherence to treatment regimens.

This article is a structured review of the available literature regarding the diagnosis and management of acute asthma.

READING 8 – PULMONARY FUNCTION RESULTS IN RESPIRATORY DISEASES

Tseng HJ(1), Henry TS(1), Veeraraghavan S(1), Mittal PK(1), Little BP(1). Pulmonary Function Tests for the Radiologist. Radiographics. 2017 Jul-Aug;37(4):1037-1058.

PubMed PMID: 28598732 [Payment required].

Author information:

(1)From the Department of Radiology and Imaging Sciences (H.J.T., P.K.M., B.P.L.) and Department of Medicine (S.V.), Emory University, 1364 Clifton Rd NE, Suite D125A, Atlanta, GA 30322; and Department of Radiology and Biomedical Imaging, University of California-San Francisco, San Francisco, Calif (T.S.H.).

ABSTRACT

Pulmonary function tests (PFTs) provide important quantitative information about lung function and can be used to elucidate pathologic conditions responsible for respiratory symptoms, assess the severity and course of disease, and evaluate the patient for suitability and timing for lung transplantation.

They are typically used in tandem with chest imaging, along with other ancillary data, to arrive at a specific diagnosis. PFTs may provide the radiologist with clues to the diagnosis and grading of a wide variety of pulmonary diseases. In this review, the authors discuss the clinical use of PFTs, their major components, and important measurements and graphical representations that are essential for understanding and interpreting the results. The key components of PFT panels—static lung volumes, dynamic lung function (spirometry), and diffusion capacity—are explained. The authors present a general algorithmic approach for problem solving, with recognition of common patterns of results (obstructive, restrictive, mixed, nonspecific, and normal). Pulmonary diseases from each of the major patterns and chest imaging are illustrated, and correlations between particular PFT results and disease severity and morphology at imaging are examined.

Common pitfalls encountered during interpretation are also highlighted. A basic understanding of the mechanics of PFTs, characteristic patterns in important diseases, and correlation between lung function and imaging findings may assist the radiologist in diagnosis and follow-up of key pulmonary diseases and strengthen the radiologist's role as part of a multidisciplinary diagnostic team.

READING 9 – SPIROMETRY AND BRONCHODILATOR TEST

Sim YS(1), Lee JH(2), Lee WY(3), Suh DI(4), Oh YM(5), Yoon JS(6), Lee JH(7), Cho JH(8), Kwon CS(5), Chang JH(7). Spirometry and Bronchodilator Test. *Tuberc Respir Dis (Seoul)*. 2017 Apr;80(2):105-112.

PubMed PMID: 28416951 [Free full text].

Author information:

(1)Division of Pulmonary, Allergy and Critical Care Medicine, Department of Internal Medicine, Hallym University Kangnam Sacred Heart Hospital, Seoul, Korea. (2)Department of Allergy, Pulmonary and Critical Care Medicine, CHA Bundang Medical Center, CHA University, Seongnam, Korea. (3)Department of Internal Medicine, Yonsei University Wonju College of Medicine, Wonju, Korea. (4)Department of Pediatrics, Seoul National University Children's Hospital, Seoul, Korea. (5)Department of Pulmonary and Critical Care Medicine, Asan Medical Center, University of Ulsan College of Medicine, Seoul, Korea. (6)Department of Pediatrics, College of Medicine, The Catholic University of Korea, Seoul, Korea. (7)Division of Pulmonary and Critical Care Medicine, Department of Internal Medicine, Ewha Womans University School of Medicine, Seoul, Korea. (8)Division of Pulmonology and Critical Care, Department of Internal Medicine, Inha University School of Medicine, Incheon, Korea.

ABSTRACT

Spirometry is a physiological test for assessing the functional aspect of the lungs using an objective indicator to measure the maximum amount of air that a patient can inhale and exhale. Acceptable spirometry testing needs to be conducted three times by an acceptable and reproducible method for determining forced vital capacity (FVC). Until the results of three tests meet the criteria of reproducibility, the test should be repeated up to eight times.

Interpretation of spirometry should be clear, concise, and informative. Additionally, spirometry should guarantee optimal quality prior to the interpreting spirometry results.

Our guideline adopts a fixed normal predictive value instead of the lower limit of normal as the reference value because fixed value is more convenient and also accepts FVC instead of vital capacity (VC) because measurement of VC using a spirometer is impossible.

The bronchodilator test is a method for measuring the changes in lung capacity after inhaling a short-acting β -agonist that dilates the airway. When an obstructive ventilatory defect is observed, this test helps to diagnose and evaluate asthma and chronic obstructive pulmonary disease by measuring reversibility with the use of an inhaled bronchodilator. A positive response to a bronchodilator is generally defined as an increase of $\geq 12\%$ and ≥ 200 mL as an absolute value compared with a baseline in either forced expiratory volume at 1 second or FVC.

READING 10 – PULMONARY FUNCTION TESTS FOR THE GENERALIST

Dempsey TM(1), Scanlon PD(2). Pulmonary Function Tests for the Generalist: A Brief Review. Mayo Clin Proc. 2018 Jun;93(6):763-771.

PubMed PMID: 29866281 [Payment required].

Author information:

(1)Division of Pulmonary and Critical Care Medicine, Mayo Clinic, Rochester, MN. Electronic address: Dempsey.Timothy@mayo.edu. (2)Division of Pulmonary and Critical Care Medicine, Mayo Clinic, Rochester, MN.

ABSTRACT

One of the frequent reasons patients see their primary care physicians is for the symptom of dyspnea. Among the objective tests to quantify this symptom is the pulmonary function test, which includes several different studies: spirometry with flow-volume loop, lung volumes, and diffusing capacity of lung for carbon monoxide. The results may indicate both respiratory and nonrespiratory disorders, including helping in the diagnosis of cardiac or neuromuscular diseases.

This review, intended for the generalist, describes common findings of pulmonary function tests and provides a road map for interpretation.