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In exercise of the powers conferred by Rule 39B and 133A of the Aircraft Rules, 1937, the following requirements are hereby issued for information, guidance and compliance.



(K. GOHAIN)
DIRECTOR GENERAL OF CIVIL AVIATION

CHRONIC OBSTRUCTIVE PULMONARY DISEASE AND ASTHMA

C O P D

1. Chronic obstructive pulmonary disease (COPD) is defined as a disease state characterized by the presence of airflow obstruction due to chronic bronchitis or emphysema. The airflow obstruction is generally progressive, can be accompanied by airways hyperactivity, and may be partially reversible.
2. Other important definitions include the following:
 - (a) Chronic bronchitis is defined as the presence of chronic productive cough for three months in each of two successive years in a patient in whom other causes of chronic cough have been excluded.
 - (b) Emphysema is defined as abnormal permanent enlargement of the airspaces distal to the terminal bronchioles, accompanied by destruction of their walls and without obvious fibrosis. Destruction is defined as non-uniformity in the pattern of respiratory air space enlargement; the orderly appearance of the acinus and its components is disturbed and may be lost.

Clinical Features

3. **Physical Examination** – Physical examination of the chest early in the disease may show only slowed expiration and wheezes on forced expiration. As obstruction progresses, hyperinflation becomes evident, and the antero-posterior diameter of the chest increases. The diaphragm is depressed and limited in its motion. Breath sounds are decreased and expiration is prolonged. Coarse crackles may be heard at the lung bases. Wheezes are frequently heard, especially on forced expiration, and permit the diagnosis of airflow

obstruction.

Investigations

4. **Chest Radiography** – Over distention of the lungs is indicated on frontal chest radiographs by a low, flat diaphragm and a long, narrow heart shadow. Flattening of the diaphragmatic contour and increased retrosternal airspace is observed on the lateral projection. Rapid tapering of the vascular shadows accompanied by hypertransradiancy of the lungs is a sign of emphysema. Studies correlating lung structure and the chest radiograph show that emphysema is consistently diagnosed when the disease is severe, is not diagnosed when the disease is mild, and is diagnosed in about half the instances when the disease is of moderate severity.

5. **Computed Tomography** – Computed tomography (CT), especially high resolution CT (collimation of 1 to 2 mm), has much greater sensitivity and specificity than standard chest radiography for the diagnosis of emphysema.

6. **Pulmonary Function Tests** – FEV₁ and the FEV₁/ FVC ratio fall progressively as the severity of COPD increases. The presence of a post bronchodilator FEV₁ <80 percent of the predicted value in combination with an FEV₁/FVC <70 percent confirms the presence of airflow limitation that is not fully reversible.

7. **Disposal (The disposals are applicable only for trained aircrew and not for initial medical for flying duties)**

- a) **Mild COPD.** FEV₁/FVC < 70%
FEV₁ ≥ 80% Predicted
With or without chronic symptoms (cough, sputum production)
- (i) Aircrew with features of Mild COPD can be given P1 status with qualified pilot for 03 –06 months and then awarded P1 status on a case to case basis with regular monitoring.
 - (ii) CXR / CT chest at initial evaluation followed by six monthly Spirometry
 - (iii) Occasional use of Ipratropium / Steroids by inhalers (metered doses) maybe permitted for flying duties. A certificate from the individual about the medication being taken and a certificate from the treating Physician with regards to the medication prescribed must be attached
 - (iv) Requirement of oral bronchodilators will disqualify the individual from flying.
 - (v) All renewals / reviews at AFCME / IAM
- b) **Moderate Severity** FEV₁/FVC < 70%
FEV₁ 50% to 80% Predicted
With or without chronic symptoms (cough, sputum production & dyspnea)
- (i) Fit to fly as copilot (P 2) only
 - (ii) All reviews / renewals at AFCME / IAM
 - (iii) CXR / CT chest at initial evaluation followed by six monthly Spirometry

- (iv) Prophylactic inhalations of Ipratropium / Steroids by metered doses are permitted for flying duties. A certificate from the individual about the medication being taken and a certificate from the treating Physician with regards to the medication prescribed must be attached.
 - (v) Requirement of oral bronchodilators will disqualify the individual from flying.
 - (vi) AMA to manage acute exacerbations and individual to be kept “off flying” during periods of exacerbation
 - (vii) Spirometry to be done prior to all reviews.
 - (viii) All reviews / renewals at AFCME / IAM
- c) **Severe COPD.** $FEV_1 / FVC < 70\%$
 $FEV_1 \leq 30\%$ of predicted
 $FEV_1 \leq 50\%$ of predicted but with associated respiratory failure
 or clinical signs of respiratory failure
 UNFIT FOR FLYING

The **P1 status** pertains to pilots fully fit for all flying duties, including instructional duties. **P2 status** pertains to fit for all flying duties except instructional duties and trainer captain in flight.

BRONCHIAL ASTHMA

8. Asthma has been defined as “A chronic inflammatory disorder of the airways in which many cells play a role, in particular mast cells, eosinophils, and T lymphocytes. In susceptible individuals this inflammation causes recurrent episodes of wheezing, breathlessness, chest tightness, and cough particularly at night and/or in the early morning. These symptoms are usually associated with widespread but variable airflow limitation that is at least partly reversible either spontaneously or with treatment. The inflammation also causes an associated increase in airway responsiveness to a variety of stimuli.”

9. **History and Physical Examination** – The classic triad of symptoms associated with asthma consists of cough, shortness of breath, and wheezing occurring simultaneously. However, it is not unusual for one or more of these complaints to be absent or for asthmatics to present with other symptoms. In addition, similar symptoms can occur in other conditions. Widespread, high-pitched, musical wheezes are characteristic of asthma although they are not specific. The presence or absence of wheezing on physical examination is a poor predictor of the severity of airflow obstruction in asthma. Wheezing may be heard in patients with mild, moderate, or severe airway narrowing. Significant airway narrowing also may be found in individuals without wheezing. The presence of wheezing alerts one to the likely presence of some degree of airway narrowing; measurement of lung function (e.g. with spirometry or peak flow measurement) is needed to quantify its severity.

10. **PULMONARY FUNCTION TESTING** – Pulmonary function tests are key to the diagnosis of asthma. Spirometry and peak expiratory flow rate and are the two pulmonary function tests most often diagnostic of asthma.

11. **Peak Expiratory Flow Rate** – The peak expiratory flow rate (PEFR) is measured during a maximal exhalation that has immediately followed a maximal inhalation.

12. **Spirometry** – Spirometry, which includes measurement of forced expiratory volume in one second (FEV₁) and forced vital capacity (FVC), is a readily available and useful pulmonary function test. FEV₁ is the most important spirometric variable for assessment of airflow obstruction. The FEV₁ reflects the average flow rate during the first second of the forced vital capacity (FVC) maneuver. It declines in direct and linear proportion with clinical worsening of airways obstruction, and it increases with successful treatment of airways obstruction.

13. **Bronchoprovocation Testing** – Another strategy for diagnosing asthma in patients with normal lung function is to attempt to provoke airflow obstruction using a stimulus known to elicit airway narrowing. The provocative stimulus should be in the form of exercise. Baseline spirometry and after exercise for a fixed duration are done. A change in more than 15% FEV₁ constitutes a positive broncho-provocative test.

14. **Other Laboratory Tests** – Other laboratory studies are occasionally used in the patient with suspected asthma. These include chest x-ray and blood tests.

15. **Chest X-Ray** – The chest radiograph is almost always normal in patients with asthma. Its potential value is to detect complications and to exclude alternative or co-morbid conditions.

16. **Blood Tests** – No blood tests are available to assess the presence or absence of asthma or to gauge its severity. However, in some patients it may be of value to investigate the allergic basis of their disease. The eosinophil count and serum immunoglobulin E (IgE) concentration, if elevated, may indicate the presence of an allergic tendency (or "atopy"). A complete blood count (CBC) with differential white blood cell analysis suffices to screen for eosinophilia; an elevated eosinophil percentage by automated cell sorter is best confirmed by manual differential.

17. Markedly elevated eosinophil percentages (>15 percent) should prompt consideration of alternative diagnoses, including parasitic infections, drug reactions, and syndromes of pulmonary infiltrates with eosinophilia. Similarly, very high IgE levels (>1000 ng /mL) suggest asthma as well as the associated conditions of eczema or allergic bronchopulmonary aspergillosis.

18. **Impairment Rating** –

(a) **Mild**

No history of any severe exacerbation in preceding 01 yrs

FEV₁ > 80 % predicted

Occasional inhaled bronchodilator/ chromoglycate / steroids for symptom control

(b) **Moderate**

No history of any severe exacerbation in preceding 06 months

FEV₁ > 70 % predicted

Regular inhaled chromoglycate / low dose steroids for symptom control with occasional inhaled bronchodilators.

(c) **Severe**

FEV₁ < 70% of predicted

Individual requiring hospitalization or oral bronchodilators / parenteral medication / nebuliser for control of bronchospasm

19 DISPOSAL (The disposals are applicable only for trained aircrew and not for initial medical for flying duties)

- (a) An aircrew that has suffered from an acute attack and is detected for the first time to have bronchial asthma will be made unfit for flying for an initial spell of 03 months.
- (b) After 03 months if he remains symptom free and all investigations are normal or in 'mild impairment range' will be awarded P1 status to fly with a qualified P2. If on periodic review he remains symptom free for more than 2 years he can be awarded full flying status. A certificate from the individual about the medication being taken and a certificate from the treating Physician with regards to the medication prescribed must be attached.
- (c) If his impairment range falls in the moderate range as in 18 (b) above, he will be made fit to fly as P2 for 6 months. Disposal thereafter will depend on status; if individual improves to mild status as in 18 (a) above, the disposal will be as para 19 (b) and if continues as moderate severity as in 18 (b) above, then he will continue in P2 status only. A certificate from the individual about the medication being taken and a certificate from the treating Physician with regards to the medication prescribed must be attached.
- (d) **If he falls in the severe range he will be declared UNFIT for flying.** A certificate from the individual about the medication being taken and a certificate from the treating Physician with regards to the medication prescribed must be attached.

The **P1 status** pertains to pilots fully fit for all flying duties, including instructional duties. **P2 status** pertains to fit for all flying duties except instructional duties and trainer captain in flight.

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