

in FEV_1 and FEV_1/FVC ([Chap. 285](#)). With worsening disease severity, lung volumes may increase, resulting in an increase in total lung capacity, functional residual capacity, and residual volume. In patients with emphysema, the diffusing capacity may be reduced, reflecting the lung parenchymal destruction characteristic of the disease. The degree of airflow obstruction is an important prognostic factor in COPD and is the basis for the GOLD spirometric severity classification ([Table 292-1](#)). Although the degree of airflow obstruction *generally* correlates with the presence and severity of respiratory symptoms, exacerbations, emphysema, and hypoxemia, the correlations are far from perfect. Thus, clinical features should be carefully assessed in each individual patient with COPD to determine the most appropriate therapies. It has been shown that a multifactorial index (BODE), incorporating airflow obstruction, exercise performance, dyspnea, and body mass index, is a better predictor of mortality. Recently, GOLD added additional elements to their COPD classification system incorporating respiratory symptoms and exacerbation history; these metrics are used to guide COPD treatment (see below).

Arterial blood gases and oximetry may demonstrate resting or exertional hypoxemia. Arterial blood gases provide additional information about alveolar ventilation and acid-base status by measuring arterial P_{CO_2} and pH. The change in pH with P_{CO_2} is 0.08 units/10 mmHg acutely and 0.03 units/10 mmHg in the chronic state. Knowledge of the arterial pH therefore allows the classification of ventilatory failure, defined as $P_{CO_2} > 45$ mmHg, into acute or chronic conditions with acute respiratory failure being associated with acidemia. The arterial blood gas is an important component of the evaluation of patients presenting with symptoms of an exacerbation. An elevated hematocrit suggests the presence of chronic hypoxemia, as does the presence of signs of right ventricular hypertrophy.

Radiographic studies may assist in the classification of the type of COPD. Increased lung volumes and flattening of the diaphragm suggest hyperinflation but do not provide information about chronicity of the changes. Obvious bullae, paucity of parenchymal markings, or hyperlucency on chest x-ray suggests the presence of emphysema.