CHRONIC PULMONARY DISEASE

Chronic obstructive pulmonary disease (COPD) refers to those pulmonary diseases characterized by obstruction to the outflow of breath, as measured by expiratory flow rates, and includes emphysema, chronic bronchitis, and some forms of chronic asthma. Restrictive pulmonary diseases are distinct in limitation of expansion of the lung and include any type of pulmonary fibrosis, chronic infection with scarring, dust deposition, etc. Although the pathology is different, a final common pathway for both major types of pulmonary disease will be breathlessness or dyspnea, hypoxia, frequent exacerbations and infections, eventual pulmonary insufficiency, and finally respiratory failure.

Most COPD in U.S. is the result of chronic tobacco use and its sequelae. It is the fourth leading cause of death nationally, counts 16 million sufferers in the U.S., is the major cause of hospitalization in Medicare recipients in Maine, and is the source of many reports of disease in license applications to Maine Bureau of Motor Vehicles. Chronic restrictive disease is much less common.

Currently the Global Initiative for Chronic Obstructive Lung Disease (GOLD)[A] guidelines as developed by World Health Organization and the National Institutes of Health define the diagnosis and severity of COPD using pulmonary function testing measuring FVC and FEV1. COPD is confirmed if the FEV1/FVC is < 0.70.

Severity of disease is divided into Classes A-D in the following way:

A MILD: FEV1 ≥ 0.80 (of predicted normal for age and sex)

B MODERATE: FEV1 ≥ 0.50 and <0.80

C SEVERE: FEV1 ≥ 0.30 and < 0.50

D VERY SEVERE: FEV1< 0.30

These categories were developed to define treatment and prognosis but can also be used to predict severity of symptoms and hypoxia. There are other systems for defining severity. For example, the previously used American Thoracic Society chart[B] uses two parameters (PFT and DLCO) and divides classes of disease slightly differently. However, none of these systems are based on oxygen saturation or PO2.

In contrast, most studies of driving ability and COPD have focused on the neuropsychological effects of hypoxia. Classic studies in the 1980's found difficulties in COPD patients on complex cognitive testing. Grant and colleagues (1982)[C] studied 203 severely hypoxic patients (mean PO2 of 51) and matched controls, and found 42% with cognitive difficulties in the study group compared to 14% in the controls. These did not correlate well with standard pulmonary function tests (PFT's). A second study by Prigatano (1983)[D] confirmed the same type of cognitive limits in slightly less hypoxic patients, mean PO2 of 66. A meta-analysis[E] done by several of these researchers in 1987 found that neuropsychological effects were correlated with level of hypoxia.

More recent studies[F G] using driving simulators, done by European researchers, have confirmed that even mildly hypoxic patients have perceptual difficulties and perform less well than controls. At least one recent study[H] has correlated hypoxia with PFT and Gold classes. Few studies however have shown higher crash rates among COPD patients, although some Utah driver data[I] suggests that persons with any pulmonary condition are at higher risk of crashes.

Restrictive diseases could be scored by similar categories as the GOLD guidelines (mild, moderate, severe, very severe) based on percent FVC and could be subject to the same driving restrictions when hypoxic pulmonary insufficiency develops.

Based on the above research, shorter review periods are required in persons with higher class of disease or those requiring oxygen (even nocturnal or partial use) given that such persons are prone to exacerbations worsening their day to day status, prone to gradual decline, and prone to experience difficulty with stressful driving conditions. Those who cannot maintain adequate oxygenation with supplementation should not drive.

FOR REFERENCES, SEE BIBLIOGRAPHY AT END OF DOCUMENT.

FUNCTIONAL ABILITY PROFILE
Chronic Pulmonary Disease[1]

Profile Levels	Degree of Impairment[2]/ Potential for At Risk Driving	Condition Definition / Example	Interval for Review and Other Actions
1.	No diagnosed condition	No known disorder	N/A
2.	Condition fully recovered	Any pulmonary condition, recovered or cured; or Minimal, reversible, episodic, controlled pulmonary condition.	N/A
3.	Active impairment	Pulmonary disease	
	a. Mild	Gold A-B, mild dyspnea; or Gold C-D, maintains O2 sat 89% or greater on room air. Moderate dyspnea, no hypoxia less than 89%; or Restrictive or other pulmonary disease of mild severity, maintains O2 sat 89% or greater on room air.	4 years
	b. Moderate	Gold C-D, moderate dyspnea. O2 sat 88% or less, or PO2 55 or less on room air, but able to maintain O2 sat 89% or greater on oxygen supplementation; or Restrictive or other pulmonary disease of moderate severity, O2 sat 88% or less on room air but able to maintain O2 sat 89% or greater on oxygen supplementation; or Exercise or sleep induced O2 sat 88% or less.	2 year If O2 sat less than 88% (on room air) while at rest or driving must use O2 while driving. Note: Those with only sleep or exercise induced hypoxia are not required to use O2 while driving.
	c. Severe	Gold D, hypoxia cannot be controlled to maintain O2 sat 89% or greater, or PO2 56 or greater; or severe restrictive or other pulmonary disease, cannot maintain O2 sat 89% or greater; or new condition under investigation, unable to maintain O2 sat 89% or greater on room air.	No driving

[1] For further discussion regarding PULMONARY DISORDER, please refer to NARRATIVE found at beginning of this section.
[2] For further explanation of degree of impairment, please refer to SECTION 3.