

Sept 2011
QUESTION 18

Outline the abnormalities in pulmonary function testing of a person with severe obstructive lung disease (40% marks). Describe the physiological changes that explain these abnormalities (60% marks).

Obstructive pulmonary disease

is characterised by increased airways resistance

may be reversible (asthma) or irreversible (COPD)

is diagnosed by forced expired spirometry (see below) with a ratio of FEV1/FVC < 70%

severity is dependent on FEV1 % predicted

mild	> 80%
moderate	50 - 79%
severe	<50%

Pulmonary function testing

Peak flow meters show a reduction in peak flow

Simple spirometry shows an increase in lung volumes
decreased inspiratory capacity
(increased FRC but not measured)

Forced expired spirometry is diagnostic

FEV1/FVC < 70%

FEV1 % predicted <50%

FEF 25 - 75% is prolonged

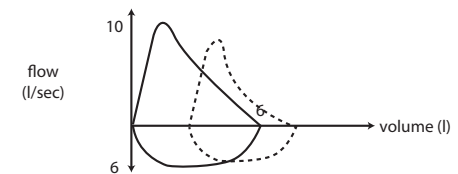
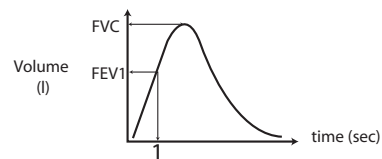
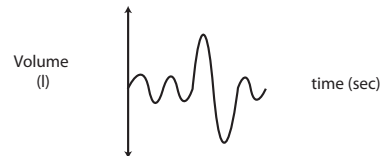
Flow volume loops

higher volumes

decreased flow

scooped effort independent portion

DLCO is decreased



Reasons

Obstructive disease is characterised by

increased airways resistance (pathognomonic)

this reduces flow rates (flow = pressure / resistance)

compensation for this is by

increased FRC which increases the calibre of airways and reduces resistance

this results in hyperinflation and gas trapping

increased pressure differential which results in the collapse of compressible airways

DLCO is reduced in COPD patients due to the loss of lung tissue