

should be watched for and treated. (Tyler, F. H., *Hyperosmolar Coma*, *Amer. J. Med.* 45: 485 (Oct.) 1968.)

### Respiration

**CSF OXYGEN TENSION** Oxygen and carbon dioxide tensions were determined in 320 CSF samples. In a few patients, cisternal fluid  $P_{O_2}$ ,  $P_{CO_2}$  and pH values were compared with simultaneously-obtained arterial and jugular venous blood values for calculation of the mean  $P_{O_2}$  in cerebral capillaries. Normal cisternal fluid was found to have values between those of arterial and jugular venous blood.  $P_{O_2}$  in lumbar CSF (31 mm Hg) is lower than that in cisternal fluid (47 mm Hg), and the  $P_{CO_2}$  is higher (44 vs. 37 mm Hg). There was significant correlation of the gas tensions in cisternal fluid with the mean capillary  $P_{O_2}$  and  $P_{CO_2}$  of the brain. There was, however, no evidence that cisternal fluid  $P_{O_2}$  is representative of mean  $P_{O_2}$  of cerebral tissue. In fluid samples with increased cell counts,  $P_{O_2}$  decreased with the degree of pleocytosis. An increase in protein was not associated with a decreased oxygen tension in CSF. AV malformations produced high  $P_{O_2}$  values in the jugular vein, provided the vein drained the shunt. In these cases, jugular  $P_{O_2}$  was occasionally found to be higher than cisternal fluid  $P_{O_2}$ . A clinical application of these findings may be the measurement of CSF oxygen tension in lieu of the carotid-jugular AV difference, thus avoiding puncture of two vessels and potential heparinization when continuous monitoring of intravascular gas tensions is indicated. In drainage of ventricles (which may extend over many hours or several days), continued monitoring of CSF gas tensions is simple, without hazard, and can provide information about perfusion and oxygen consumption of the brain. Monitoring CSF gas tensions may also be useful in the study of the effects of vasopressors or anesthetic drugs on the brain. (Gacschirt, H.: *Oxygen Tension in Cerebrospinal Fluid of Man. Physiological and Clinical Significance*, *Klin. Wschr.* 46: 771 (July) 1968.)

**RESPIRATORY RESISTANCE** Total respiratory, lung and chest wall flow resistances were measured in spontaneously-breathing patients with obstructive lung disease by imposing flow oscillations at the airway. Total respiratory and lung resistance decreased with increasing breathing frequency. Compliance was also frequency-dependent. Such frequency dependence was interpreted as a function of uneven distribution of mechanical properties of the lungs. (Grimby, G., and others: *Frequency Dependence of Flow Resistance in Patients with Obstructive Lung Disease*, *J. Clin. Invest.* 47: 1455 (June) 1968.) **ABSTRACTER'S COMMENT:** This paper is vital not only for its conclusions but because of the thoroughness with which the technique of forced oscillations was investigated. Although more than a decade has elapsed since the oscillator technique for investigating airflow resistance was proposed, the application of this technique is apparently coming into fashion. We have witnessed cumbersome techniques such as the plethysmographic, esophageal balloon and interrupter methods. It will remain for time to determine whether the oscillator technique is better. Simultaneous determinations of lung volume should be made but, unfortunately, this remains extremely difficult in a supine, anesthetized patient.

**DIFFUSING CAPACITY** Changes in pulmonary capillary blood volume have been studied by various techniques. The carbon monoxide diffusing capacity ( $DL_{CO}$ ) is of special interest. Since exercise causes greater increases in breath-holding pulmonary diffusing capacity than can be produced by other means, the mechanism by which this change occurs is important. The increase in  $DL_{CO}$  implies an enlargement of the effective pulmonary capillary bed. Previous studies have shown that increases in pulmonary blood flow alone do not increase  $DL_{CO}$ . Procedures which transfer blood from the peripheral circulation to the lung or increase pulmonary vascular pressure do increase  $DL_{CO}$  somewhat, primarily by increasing pulmonary capillary blood volume. Breath-holding  $DL_{CO}$  was determined in 12 normal subjects, seated and supine, at