

an open thorax, the lower lung receives the greater pulmonary blood flow while the exposed lung is preferentially ventilated if allowed to expand freely; (2) although maldistribution would tend to raise  $PCO_2$ , the use of an endotracheal tube and the depression of carbon dioxide output (because of the reduction in metabolic activity) have the opposite effect. Therefore, a normal arterial  $PCO_2$  can be maintained by a minute volume of ventilation close to the normal for the conscious resting subject. (Nunn, J. F.: *Distribution of Inspired Gas During Thoracic Surgery*, *Ann. Roy. Coll. Surg. Engl.* 28: 223 (Apr.) 1961.)

**LUNG VOLUMES** Changing from sitting to either the supine or prone position caused a decrease in the expiratory reserve volume and the functional residual capacity in human volunteers. The decrease in both subdivisions of lung volume was less in the prone position than in the supine position. The diaphragm is probably at a lower level in the prone position. Total lung capacity decreased in both the supine and prone positions. (Moreno, F., and Lyons, H. A.: *Effect of Body Posture on Lung Volumes*, *J. Appl. Physiol.* 16: 27 (Jan.) 1961.)

**LUNG MECHANICS** Surface tension phenomena appear to account for a large part of the retractive force of excised lungs. However, conclusions drawn from observations of the activity of antifoaming agents in pulmonary edema do not support this view. Pulmonary vascular distension influences lung retraction. Tissue stability is due to low compressibility of the surface, which allows the largest possible number of air spaces to remain open, and to the high elastic modulus of collagen, which helps to insure equal expansion of air spaces. During breathing, flow resistance of the gas and tissues produces an additional volume pressure hysteresis which plays only a small role in the combined static and dynamic volume pressure hysteresis of lungs. Dynamic compliance, the ratio of the tidal volume to the change in pressure between points of zero flow at the extremes of the tidal volume, is independent of a wide range of breathing frequencies in normal lungs, but decreases with increasing breathing frequency

with bronchoconstriction. Although conductance increases with increase in lung size, the relationship is complex. (Mead, J.: *Mechanical Properties of Lungs*, *Physiol. Rev.* 41: 281 (Apr.) 1961.)

**MECHANICAL VENTILATION** Twenty-three patients with diffuse chronic lung disease with life-threatening respiratory failure were treated by tracheotomy and mechanical ventilation. The respiratory crisis was produced by pneumonia, influenza, acute bronchitis, overdose of morphine, abdominal surgery, acute pancreatitis, or diabetic precoma in the patients who already had chronic bronchitis or chronic ventilatory disability due to pulmonary fibrosis after tuberculosis. Three patients had kyphoscoliosis. Tracheotomy was performed on all patients, a rubber-cuffed tube was inserted into the trachea and mechanical ventilation with 6 to 10 liters per minute of a high-oxygen mixture using a Lundia intermittent positive/negative pressure respirator was instituted. Usually the arterial oxygen saturation became normal and the patients regained consciousness after a few hours. Fifteen patients survived the crisis and 8 died. Of those who survived, the mechanical ventilation lasted an average of 13 days. Of those that died, ventilation was continued an average of 44 days. (Munck, O., Kristensen, H. S., and Lassen, H. C. A.: *Mechanical Ventilation for Acute Respiratory Failure in Diffuse Chronic Lung Disease*, *Lancet* 1: 66 (Jan. 14) 1961.)

**COMPLIANCE** The total respiratory compliance of anesthetized, relaxed adults is lower than that in awake subjects. This is probably due to the inability of conscious individuals to relax completely. Pulmonary compliance of resting newborn infants is low when compared on a lung weight basis to those recorded in the adult. Measurements of total lung and chest wall compliance at various airway pressures in 21 normal infants paralyzed with succinylcholine show that the average total compliance for a given airway pressure is greater when immediately preceded by an inflation at a higher airway pressure than by one at a lower airway pressure. A similarity between values for pulmonary and total com-