

(Bergofsky, E. H.: *Mechanism for Respiratory Insufficiency After Cervical Cord Injury*, *Ann. Intern. Med.* 61: 435 (Mar.) 1964.)

EXPERIMENTAL LUNG COLLAPSE

Rate, volume, and time of lung collapse following tracheal occlusion in rats breathing 100 per cent oxygen at varying ambient pressures was studied. Rate of lung collapse was proportional to oxygen uptake and increased as barometric pressure decreased. Alveolar carbon dioxide tension and water vapor tension were also determinants of rate of lung collapse. Determination of collapse time is predictable in any species for any given lung volume and rate of oxygen uptake. (Robertson, W. G., and Farhi, L. C.: *Rate of Lung Collapse After Airway Occlusion on 100 Per Cent O₂ at Various Ambient Pressures*, *J. Appl. Physiol.* 20: 228 (Mar.) 1965.)

MOTOR CONTROL OF LUNG

Stimulation of the efferent cervical vagus nerve in cats and dogs increased airway resistance. Response increased with increasing frequency and became maximal at 12/second. Dead space decreased during vagal stimulation. The largest response to stimulation was in the homolateral lung. Rapid freezing of lung tissue and microscopic examination revealed that the primary site of bronchoconstriction was in the lobar bronchi. Smaller bronchi were less uniformly involved and respiratory bronchioles and alveolar ducts were not constricted. (Olsen, C. R., and others: *Motor Control of Pulmonary Airways Studied by Nerve Stimulation*, *J. Appl. Physiol.* 20: 202 (Mar.) 1965.)

POSTOPERATIVE RESPIRATION

Studies of respiratory volumes and mechanics have been made in 22 patients undergoing thoracic surgery and 11 patients undergoing abdominal surgery preoperatively and postoperatively at 1 to 3 hours, 4 to 6 hours, 1 day, and 1 week. In the patients who had had thoracotomy, tidal volume, lung compliance, work per breath, arterial pH, and standard bicarbonate were all significantly decreased in the postoperative period. Breathing rate was increased to maintain the preoperative minute volume. The reduced compliance means that increased effort was required to move air in

and out of the lungs no matter what its cause. The changes were maximal immediately after the operation, and at the end of a week had not yet completely returned to normal. (Lewis, J. L., and Welch, J. A.: *Respiratory Mechanics in Postoperative Patients*, *Surg. Gynec. Obstet.* 120: 305 (Feb.) 1965.)

ASPIRATION PNEUMONITIS

Effect of aspiration was studied in dogs using different solutions of various pH and quantity. Sequelae of aspiration pneumonitis were found to be directly proportional to the acidity and volume of the aspirated solution. Low pH and large volumes produced more severe reactions. A syndrome of sudden apnea and hypotension immediately following aspiration was noted in all animals except those in which saline solution was used. This could be abolished with bilateral vagotomy, but not with atropine. Attempted neutralization of low pH aspirants did not alter the usual reaction. (Exarajos, N. D., and others: *Importance of pH in Volume and Tracheal Bronchial Aspiration*, *Dis. Chest* 47: 167 (Feb.) 1965.)

RESPIRATORS

Serial determinations of cardiac output, blood gases, and electrolyte values have revealed three basic patterns of circulatory response in 42 patients whose respiratory tidal gas exchange was assumed by a volume displacement respirator for periods up to 12 days. Mechanical ventilation can improve an abnormal metabolic status due to cardiac or pulmonary dysfunction by increasing blood gas exchange. When a normal cardiovascular system is present and capable of responding, cardiac output rises to a value sufficient to satisfy the total body requirements for circulation. By decreasing the perfusion requirements of the respiratory muscles, the total demand for circulation is reduced and perfusion to other parts of the body is improved in patients incapable of elevating cardiac output. (Clowes, G. H., and others: *Patterns of Circulatory Response to the Use of Respirators*, *Circulation* 31: 1-157 (Apr.) 1965.)

HYPOTHERMIA

Renal hemodynamics were studied during hypothermia of the denervated dog kidney while blood viscosity and

extravascular pressure were kept constant. Both vasodilatation and vasoconstriction may occur during the cooling period. Active renal vasoconstriction occurred during the rewarming period secondary to release of adrenergic agents. (Hinshaw, L. B., and others: *Renal Vascular Response to Hypothermia, Proc. Soc. Exp. Biol. Med.* 118: 623 (Mar.) 1965.)

HYPOTHERMIA An 11 month old child was admitted to the hospital with coma, generalized convulsions, fever, and a diagnosis of meningitis. Therapy to stop convulsions was unsuccessful. Her body temperature was lowered inadvertently to 74° F. and then elevated and kept between 94° and 96° F. for a week. This therapy rapidly controlled the convulsions and the child was discharged cured. (Robinson, A., and Buckler, J. M. H.: *Emergency Hypothermia in Meningococcal Meningitis, Lancet* 1: 81 (Jan. 9) 1965.)

HYPOTHERMIA Bile was collected from rats anesthetized with pentobarbital, both intact and nephrectomized, at various time intervals after the intravenous injection of C¹⁴-atropine, and at body temperatures of 37°, 25° and 17° C. Urine was collected and analyzed at the termination of the 4 hour experiment. In the intact animal 50 per cent of the atropine appears in the bile and in the nephrectomized animals 70 per cent appears in the bile within 4 hours. Deep hypothermia appears to more markedly impair renal excretion of atropine and/or metabolites than it does hepatic excretion. At the lowest temperature studied, 17° C., the liver was capable of completely altering the material excreted in the bile. On the other hand, the kidney was unable to excrete C¹⁴ into the urine at 17°. (Kalsner, S. C., and others: *Drug Metabolism in Hypothermia. I. Biliary Excretion of C¹⁴-Atropine Metabolites in the Intact and Nephrectomized Rat, J. Pharmacol. Exp. Ther.* 147: 252 (Feb.) 1965.)

HYPOTHERMIA Of 277 patients with acute head trauma, 24 were treated by therapeutic hypothermia. Five patients soaked in ice water and 1 treated with cooled blanket were anesthetized with ether, while 1 soaked in ice water and 6 treated with cooled blanket were anesthetized with nitrous oxide. Of the

24 patients, 17 recovered and were uneventfully discharged, and 7 died. The cause of death was pneumonia in 1 patient and respiratory paralysis in 4; in 2 fatal cases therapeutic hypothermia was considered to have been protracted beyond the optimal time. The most suitable level of hypothermia was 25–30° C. and the optimal duration was less than 48 hours. (Makino, K., and others: *Therapeutic Hypothermia For Head Trauma (Japanese), Operation (Tokyo)* 18: 45, 1964.)

CENTRAL VENOUS PRESSURE Central venous pressure provides a sensitive and instantaneous picture of circulatory hemodynamics. It measures the resultant of three components which comprise the circulation, namely blood volume, cardiac pump, and the vascular bed and its resistance. Its use is advocated in every elderly patient undergoing extensive surgical procedures, and in patients who are oliguric or in those patients in whom there has been a forced diuresis. (Borow, M., and others: *Use of Central Venous Pressure as an Accurate Guide for Body Fluid Replacement, Surg. Gynec. Obstet.* 120: 545 (Mar.) 1965.)

SHOCK The two best monitors of fluid and blood volume replacement are the hourly urinary output and the central venous pressure. Blood volume determinations are useful, but they tend to be unreliable in shock. Before considering the use of either vasopressors or vasodilators, one should be certain that blood volume deficits have been corrected. In septic shock, the use of a steroid along with an adrenergic blocking agent seems indicated. Adrenergic blocking agents may be of value when used with adequate blood volume replacement, but considerable thought must be given to a technic that considers lowering an already low blood pressure in order to promote perfusion of tissue. (Hamit, H. F.: *Current Trends of Therapy and Research in Shock, Surg. Gynec. Obstet.* 120: 835 (Apr.) 1965.)

PULMONARY RESISTANCE In young calves, pulmonary vascular resistance was found to increase after total cardiopulmonary bypass, secondary to an increase in pulmonary arterial pressure without changes in cardiac