BRIEFS FROM THE LITERATURE

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RESPIRATORS To provide effective ventilation to a patient with high resistance and low compliance (emphysema) it is advantageous to choose as high a mask-pressure range as is compatible with safety. Optimal inflow rates are quite low, 15–30 liters per minute. It should be possible, therefore, to regulate inflow gas rates over a wide range and down to much slower rates than are usually available. Present commercially available apparatus do not do this since they provide peak flow rates of 80–90 liters per minute. The Seeler respirator, however, is effective. (*Hickam, J. B., and others: Use of Mechanical Respirators in Patients with High Airway Resistance, Ann. New York Acad. Sc. 66: 866* (*April*) *1957.*)

ARTIFICIAL RESPIRATOR Under nitrous oxide-oxygen anesthesia with succinylcholine drip, this artificial respirator monitors the end-tidal (and hence usually the arterial) carbon dioxide tension and automatically varies the pulmonary inflating pressure accordingly to maintain the carbon dioxide tension at the desired level. (*Frumin, M., and Lee, S. J.: Physiologically Oriented Artificial Respirator Which Produces N_2O-O_2 Anesthesia in Man, J. Lab. & Clin. Med. 40: 617* (*April*) *1957.*)

OXYGEN SATURATION Continuous recordings of oxygen saturation of venous, right heart, and pulmonary arterial blood have been obtained with an oximeter cuvette-amplifier system during cardiac catheterization. The technique might be superior to intermittent sampling and chemical analyses of blood samples. (*Wiederhielm, C. A., Bruce, R. A., and John, G. G.: Continuous Recording of Oxygen Saturation During Cardiac Catheterization, Am. J. Med. Sc. 233: 542* (*May*) *1957.*)

OXYGEN TENSIONS Oxygen tensions of tissues *in vivo* may vary from values near the tension in arterial blood down to zero. In vasodilated skin, oxygen tension approaches that of arterial blood, and changes in inspired air are quickly reflected by changes in oxygen tension in the skin. The pressure of oxygen in the skin will increase four to five times when a person breathes oxygen compared to tension present when subject breathes room air. Arterial occlusion produces a fall in tension. Transfer of oxygen from capillaries to tissues is rapid. (*Montgomery, H.: Oxygen Tension of Tissues in Vivo, Circulation 15: 646* (*May*) *1957.*)

OXYGEN REMOVAL Normal values at rest are 40 cc. per liter of ventilation and at exercise 60 cc. A diminished oxygen removal or one which decreases with exercise, or both, may indicate unrecognized right ventricular damage, intraluminal neoplastic invasion or extraluminal compression of the right or left pulmonary artery. (*Korach, J. C., and Morales, G.: Clinical Significance of Oxygen Removal, J. Thoracic Surg. 33: 690* (*May*) *1957.*)

FETAL OXYGENATION One-tenth of deaths in America are those of babies dying in association with the birth process. The oxygen supply of the fetus corresponds to that at 33,000 feet altitude. The fetal blood is oxygenated at a pressure of 35–40 mm. of mercury, and the fetus is continuously cyanotic. Placental blood to the fetus has 8.0 volumes per cent oxygen and there are 3.5 volumes per cent in the umbilical artery, making an adequate difference. Protective features for the fetus include a high hemoglobin—17 Gm., a fetal hemoglobin which picks up more oxygen per gram than adult hemoglobin, preferential circulation to the brain, and relative inactivity. Relative placental insufficiency is an important factor in perinata. mortality. Early recognition and proper treatment can reduce the mortality of babies in the perinatal period. (*Barnes, A. C.: Hazards of Being Born, Postgrad. Med. 21: 339* (*April*) *1957.*)

HYPOTHERMIA Cooling dogs as low as 16 F. produced no significant barrier to transfer of carbon dioxide from blood to lung. There is a fall in diffusing capacity of oxygen of about 5 per cent of the initial value per degree fall in temperature. There is a fall in oxygen consumption of about 6 per cent per degree, and a similar fall in cardiac output. (*Otis, A. B., and Jude, J.: Effect of Body Temperature on Pulmonary Gas Exchange, Am. J. Physiol. 188: 335 (Feb.) 1957.*)

SHOCK Bacterial toxins may complicate cases of prolonged traumatic shock. The infection must be controlled or damaged muscle excised. The restoration of normal hemodynamics is likely to be achieved only by the combined use of vasoconstrictors with blood, plasma, or dextran. In many cases of severe injury, blood is lost not only externally, but also into the tissues and around fracture sites. Therefore, unless this later loss is accounted for, a blood deficit may persist in spite of what appears to be adequate replacement. In the late phase of hemorrhagic shock, central cardiac failure may occur, with failure of response to transfusion. Normal function can be restored by administration of sympathomimetic drugs, as metaraminol or noradrenalin. The effect of these drugs on the heart is separate from their vasoconstriction action in the periphery. (*Dudley, H. A. F.: Recent Advances in Understanding and Management of Haemorrhagic and Wound Shock, J. Roy. Coll. Surgeons Edinburgh 2: 202 (March) 1957.*)

SHOCK In the differential diagnosis of low blood volume, other causes of signs and symptoms of shock must be considered: (1) paroxysmal cardiac arrhythmia; (2) reflex depression of cardiac activity; (3) chemical or metabolic depression of cardiac function; (4) reflex, chemical or mechanical release or increase in peripheral resistance; (5) interference with venous return to the heart; (6) acute dilatation and failure of either or both chambers of the heart; (7) coronary insufficiency or myocardial infarction; (8) abnormalities of adrenal function and of water, sodium, potassium and protein metabolism. (*Newman, E. V.: Evaluation of Cardiovascular Complications, Ann. New York Acad. Sc. 66: 860 (April) 1957.*)

BLOOD VOLUME As much as 1,500 cc. of blood may be present in tissues of the hip and thigh without outward evidence of its presence. In 111 patients with fracture of the hip 46 per cent had a plasma volume deficit of 300 to 2,000 cc. Studies of blood volume alone can provide information about specific needs of patients with regard to amounts and types of blood and blood substitutes, and can indicate the amount of circulating protein required to replenish deficits. (*Barbour, C. M.: Nutritional and Hematological Factors in Geriatric Anesthesia, Ann. New York Acad. Sc. 66: 844 (April) 1957.*)

BLOOD VOLUME Blood volume dedeterminations were made by the radioactive isotope (iodinated serum albumin) technique in 24 patients who had craniotomies performed. Studies were before and daily after operation. There is a further insidious blood loss following operation that may be greater in volume than the measured loss at operation. (*Smolik, E. A., and others: Blood Volume Changes in Neurosurgical Operations as Determined by Radioisotopes, Surg. Gynec. & Obst. 104: 565 (May) 1957.*)

HEART AND BRAIN PERFUSION The results of perfusing only the heart and brain for right ventriculotomy surgery in 121 experiments are reported. In 11 dogs under normothermic conditions, 7 died, 4 with evidence of cord damage. Eighty-five dogs were cooled to 25–30 C. Thirty-six of the 85 survived. In 27 of the animals, death was due to pulmonary congestion. Twenty-five dogs were cooled to 30–32 C. and lessons learned were applied with only 4 deaths—all of these being due to pulmonary congestion. Blood pressure was maintained at 85 mm. of mercury during perfusion. (*Kay, J. H., and others: Coronary and Carotid Artery Perfusion During Total By-Pass of Heart, J. Thoracic Surg. 33: 265 (April) 1957.*)

VENTRICULAR FIBRILLATION Ventricular fibrillation was induced in 48 dogs with a shock through the heart of 10 volts for ½ to ¾ second. Defibrillation was attempted with electric shocks of various voltages and durations. There was no significant difference in ability to