

cases. (Head, J. M.: *Respiratory Failure after Thyrectomy for Myasthenia Gravis*, *Ann. Surg.* 160: 123 (July) 1964.)

ULTRAVIOLET IRRADIATION The influence of ultraviolet irradiation of the operating room on the incidence of postoperative wound infections was investigated by means of a double-blind, randomized study in five institutions. Over a two year period, 14,854 operations and 15,613 incisions were studied in relation to postoperative wound infection. Although ultraviolet irradiation reduced the number of airborne bacteria in the operating room, the wound infection rate in the entire series following operation was 7.4 per cent in the irradiated rooms and 7.5 per cent in the unirradiated rooms. The only category of wounds that benefitted significantly from the use of ultraviolet radiation was the refined-clean group, in which the postoperative infection rate was reduced from 3.8 to 2.9 per cent. Even this beneficial effect, which was confined to a category representing only 19.2 per cent of all infections analyzed, was lost in the overall experience, offset by an apparent detrimental effect of irradiation on unclean wounds. (*Postoperative Wound Infections: The Influence of Ultraviolet Irradiation of the Operating Room and of Various Other Factors. Report of an Ad Hoc Committee of the Committee on Trauma, Division of Medical Sciences, National Academy of Sciences-National Research Council*, *Ann. Surg.* 160: Supplement (Aug.) 1964.)

COLD BLOOD BANK To avoid the effects of cardiac and general hypothermia during massive hemorrhage, cold blood bank should be warmed to body temperature when administered rapidly and in large amounts. The incidence of cardiac arrest during massive blood replacement (3,000 ml. or more per hour) was reduced from 58.3 per cent to 6.8 per cent by warming the cold blood from the bank to body temperature while being transfused. (Boyan, C. P.: *Cold or Warmed Blood for Massive Transfusions*, *Ann. Surg.* 160: 282 (Aug.) 1964.)

VENTILATORS Ventilators are of value under three main circumstances: (1) inadequate ventilation, (2) intractable left heart

failure, and (3) cerebral edema. Each of these situations requires different ventilator characteristics. The performance of the Blease P3, Engström, Morch Piston, Bird Mark 7 and 8 and Bennett PR1 and PR2 respirators were evaluated in these specific clinical situations. Patients with normal lungs were ventilated satisfactorily by any of the equipment mentioned. Those with chronic pulmonary disease were best managed with patient-triggered, flow-adjustable machines, the preference being for the Bird Mark 7 or Bennett PR2. Those requiring hyperventilation, particularly against increased resistance, were best managed by any of the volume-cycled group. The Bennett equipment did not function satisfactorily under these circumstances; and although the Bird ventilators are capable of required high pressures, they still produced volume-variable respiration and were not as efficient as the volume-cycled group. Pulmonary edema was satisfactorily reversed with either the Bird or Engström machines, using high mean inflation pressures and the expiratory retard. The Bird had the advantage of patient-triggering and easy alcohol nebulization. Low mean intrathoracic pressures were easily achieved by using Bird Mark 8, Bennett PR2 or Engström machines. The first two were preferred for the management of cerebral edema, as patient-triggering prevented an inflation occurring out of phase and causing a sudden rise in intrathoracic and intracranial pressures. (Fairley, H. B., and Hunter, D. D.: *Performance of Respirators Used in the Treatment of Respiratory Insufficiency*, *Canad. Med. Ass. J.* 90: 1397 (June 20) 1964.)

AIR-MIX CONTROLS Certain ventilators in common use for prolonged intermittent positive pressure respiration incorporate an injector system for air entrainment. It is generally believed that these machines deliver 40 per cent oxygen in the inspired air, when this gas is used as the motive force. To determine the actual percentage being delivered, mean inspired oxygen levels, delivered by the Bennett PR1 and Bird Mark 7 ventilators, were measured at various cycling pressures. Using the Bird ventilator, oxygen levels varied from 51.5 to 96.8 per cent, being highest at low flows and at high cycling pressures. The Bennett PR1 delivers more constant percentages of

oxygen, in the range of 61.5 to 72.3 per cent. With both makes of machine, each ventilator provides different inspired oxygen levels under comparable circumstances. This type of equipment should be driven by compressed air, oxygen being added as required. (Fairley, H. B., and Britt, B. A.: *Adequacy of the Air-Mix Control in Ventilators Operated from an Oxygen Source, Canad. Med. Ass. J.* 90: 1394 (June 20) 1964.)

OBSTETRIC ANALGESIA The Central Midwives Board are considering approving the use of premixed nitrous oxide and oxygen in equal parts, stored in tanks under pressure, by midwives on their own responsibility in domiciliary deliveries rather than the presently used gas and air. The mixture will not deliver hypoxic mixtures unless cooled to minus eight degrees centigrade when the cylinder is to be warmed or inverted three times. (Gale, C. W., Tunstall, M. E., and Wilton-Davies, C. C.: *Premixed Gas and Oxygen for Midwives, Brit. Med. J.* 1: 732 (Mar. 21) 1964.)

POSTOPERATIVE HYPOXEMIA Of 32 subjects undergoing partial gastrectomy, 18 developed atelectasis. Of these, 14 were cigarette smokers and 12 had chronic bronchitis. Seven bronchitics developed broncopneumonia. All subjects had shallow, more rapid respiration postoperatively and decreased, though improving, ventilation and hypoxemia for five days. Those subjects with atelectasis were more hypoxemic probably due to impaired ventilation-perfusion relationships. In the nonatelectatic cases, the hypoxemia was relieved by 30 per cent oxygen, but only partially relieved in the atelectatic cases. (Palmer, K. N. V., and Gardiner, A. J. S.: *Effect of Partial Gastrectomy on Pulmonary Physiology, Brit. Med. J.* 1: 347 (Feb. 8) 1964.)

CHEST INJURY Following chest injury arterial oxygen desaturation may be present even though the arterial carbon dioxide tension is normal. In the absence of mechanical causes, hypoxemia may be caused by alveolar hypoventilation, disturbance in ventilation-perfusion relationships and right to left shunts. If oxygen administration does not always fully

correct the hypoxemia, a considerable amount of shunting is probably present. (Whitcomb, J. G., and Norman, J.: *Hypoxaemia after Crush Injury of the Chest, Brit. Med. J.* 1: 349 (Feb. 8) 1964.)

HYPOTHERMIA During accidental hypothermia, arterial oxygen tensions were low and the alveolar-arterial oxygen tension gradient increased. Due to the shift in the oxygen-hemoglobin dissociation curve with fall in temperature, arterial desaturation was not so marked. Oxygen breathing does not always raise these tensions appreciably, some subjects requiring mechanical assistance to ventilation. Probably severe hypoxia at the cellular level occurs. (McNicol, M. W., and Smith, R.: *Accidental Hypothermia, Brit. Med. J.* 1: 19 (Jan. 4) 1964.)

INCISIONAL HERNIA Studies of respiratory changes were carried out during repair of large epigastric hernias. Conventional closure was shown to interfere with respiration by reducing the intra-abdominal space for the viscera. Respiratory movements, static lung volume, and functional ventilatory capacity were reduced, thus predisposing the patients to pulmonary complications. A technique is described for closing the hernia with flaps of fascia from the rectus sheath. The wound repair is more satisfactory, since there is less tension on the tissues. The new technique, which reduces intra-abdominal space only moderately, does not cause any impairment of respiratory function. (Arner, O., Eriksson, F., and Sundblad, R.: *Epigastric Incisional Hernia, Acta Chir. Scand., Suppl.* 320, 1963.)

CARDIAC AUGMENTATION A pump-driven circulation assistant is proposed for the treatment of hemorrhagic shock. It would lower the work of the left ventricle, improve coronary perfusion, increase systemic blood pressure and flow, reduce blood viscosity, and improve tissue perfusion and oxygenation. A pump and timing device were built so that the pump stroke augments the cardiac output. When used in dogs, metabolic and physiologic functions were improved. Mortality from a standard hemorrhage declined from 70 per cent to 32 per cent. (Callaghan, P. B., Wat-