lar ventilation according to the formula:

$$P_{CO_2} = (P_B - 47)\frac{\dot{V}_{CO_2}}{\dot{V}_A}$$

On the other hand, using a semiopen circuit, P_{CO_2} is determined by fresh gas flow rather than by alveolar ventilation[1-4]:

$$P_{CO_2} = (P_B - 47)\frac{\dot{V}_{CO_2}}{\dot{V}_{fresh\ gas}}$$

In the present investigation, normocarbia is achieved by a fresh-gas inflow of 5 l/min, which is approximately equal to the alveolar ventilation volume of the average adult. Normocarbia is maintained at different rates of ventilation. Hypercarbia occurs only when patients are hypoventilated. These findings may also apply to other semiopen circuits[1]; rebreathing in various semiopen systems differs less during controlled ventilation than it does during spontaneous ventilation.[2,5]

During IPPV with semiopen circuits normocarbia can be achieved in adults by a fresh-gas inflow of 5 l/min provided the patient is ventilated with not less than the minute ventilation volume. This technique provides a simple method of maintaining normocarbia during clinical anesthesia without repeated blood gas measurements, in adults over a wide range of age, weight and minute ventilation volumes. Pa_{CO_2} is controlled independent of ventilation. Normocarbia can be combined with relatively large tidal volumes and periodic hyperinflations which are required to prevent atelectasis during positive-pressure ventilation.[6-8] Carbon dioxide stores are not depleted during anesthesia, thus avoiding posthyperventilation hypoxemia during recovery.[9]

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Surgery

ABDOMINAL GAS VOLUME The average volume of abdominal gas at atmospheric pressure in healthy military personnel, as measured by body-volume plethysmography, was 111 ml. At a simulated pressure of 230 torr, abdominal gas volume increased to 500 ml, and 50 per cent of the subjects completed of abdominal discomfort and fullness. As ambient pressure was decreased further, abdominal gas volume continued to expand, and when a volume of about 1,090 ml was attained, abdominal pain was reported. *(Greenwald, A. J., Allen, T. H., and Bancroft, R. W.: Abdominal Gas Volume at Altitude and at Ground Level, J. Appl. Physiol. 26: 177 (Feb.) 1969.)*