Comment

The accuracy of a nomogram is primarily dependent upon the ratio of the scale used. Smaller ratios give more accurate readings, since fractions of units can be entered easily. The size of the nomogram described is 7.5 × 6.5 inches with accuracy as follows:

\[ \frac{V_A}{V_E} \] has an estimated error of ±0.01, since the smallest values for \( F_{\text{CO}_2} \) and \( F_{\text{O}_2} \) which can be visibly interpolated are ±0.050 per cent and ±0.025 per cent, respectively. The estimated alveolar ventilation is in the range of ±0.0005 l/min if the \( \frac{V_A}{V_E} \) ratio is ±0.01 is used and \( V_E \) is ±0.05 l/min. The estimated error for \( V_{\text{CO}_2} \) and \( V_{\text{O}_2} \) is in the range of ±1 ml/l/min \( V_E \) when the smallest units of \( F_{\text{CO}_2} \) and \( \Delta F_{\text{O}_2} \) which can be interpolated are ±0.025 per cent and ±0.05 for \( V_E \) l/min.

References


Blood Transfusion

BLOOD TRANSFUSION AND PULMONARY EDEMA This is a report of two cases of normovolemic pulmonary edema following whole-blood transfusion, each attributable to noncytotoxic leukoagglutinating antibodies present in donor serum which reacted with the recipient's leukocytes. In one patient, a 21-year-old woman, the response occurred five days after an appendectomy during a single blood transfusion and was manifest in severe dyspnea, anxiety, and cyanosis. Chest x-ray showed extensive, fluffy, bilateral infiltrates compatible with pulmonary edema. At the height of the reaction \( P_{\text{O}_2} \) was 44 torr, \( P_{\text{CO}_2} \) 27 torr, pH 7.5. The second patient received two units of whole blood because her hemoglobin was 9.7 g/100 ml secondary to metrorrhagia. Pulmonary edema occurred in the course of the second transfusion. No antirheocytic antibodies were detected, but both donor bloods contained antibodies to the recipient's leukocytes. Both donors were multiparous women, and the authors raise the possibility that multiparous women should not be used as blood donors. The reaction in the recipients was characterized by lack of eosinophilia and was strikingly similar to the acute pleuropneumonic reaction associated with nitrofurantoin administration. Since prospective antileukocyte screening is not generally available, the authors suggest that greater support should be given to administration of blood components rather than whole blood. (Thompson, J. S., and others: Pulmonary "Hypersensitivity" Reactions Induced by Transfusion of Non-HLA Leukoagglutinins, N. Engl. J. Med. 284: 1120–1125, 1971.)

Comment: This represents the first well-documented case of pulmonary edema caused by hypersensitivity to formed elements in whole blood. The time has come to consider seriously the role of massive blood transfusions and their effect on the pulmonary circulation as a principal cause of respiratory insufficiency. Evidence against the desirability of indiscriminate transfusion of whole blood is mounting.