USE OF UNITS OF THE ISL-2 AND AIK-RP64 APPARATUSES TO CREATE AN EXTRACORPOREAL CIRCULATION FOR RESUSCITATION PURPOSES

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UDC 616-036.882-08:616.12-008.1-78

A heart–lung apparatus was assembled from units of the Soviet ISL-2 and AIK-RP64 apparatuses. When connected peripherally to the vascular system of dogs weighing from 5 to 15 g, the assembly maintained an artificial circulation with a volume velocity of about 80-100 ml/kg body weight/min in the course of resuscitation after clinical death.

By contrast with the central connection of the heart–lung apparatus to the vascular system used in cardiac surgery, for resuscitation after clinical death the peripheral method of connection is preferable. However, it requires facilities for active withdrawal of the venous blood to be included in the design of the apparatus.

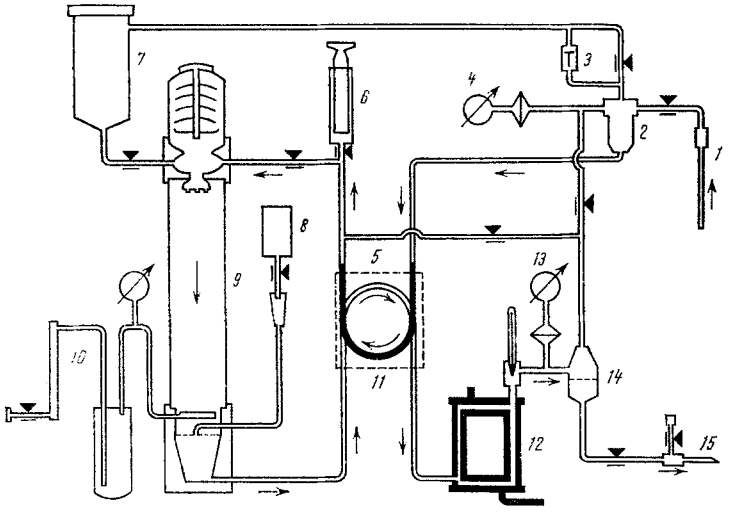

Fig. 1. Theoretical diagram of heart–lung resuscitation apparatus: 1) venous catheter; 2) venous receiver; 3) safety valve; 4) venous manometer; 5) venous roller pump; 6) blood flow meter; 7) reservoir; 8) dropper for injection of preparations; 9) oxygenator; 10) dosimeter for gas supply to oxygenator; 11) arterial roller pump; 12) heat-exchanger; 13) arterial manometer; 14) filter-trap; 15) arterial catheter. Arrows show direction of blood flow in apparatus.

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Translated from Byulleten' Éksperimental'noi Biologii i Meditsiny, Vol. 72, No. 8, pp. 123-124, August, 1971. Original article submitted December 1, 1970.

At V. A. Negovskii's suggestion, a heart–lung apparatus with a working capacity of 0.9–1 liter and an output of up to 2 liters/min, was assembled from components of the Soviet ISL-2 [2] and AIK-RP64 [1] apparatuses (Fig. 1). Active withdrawal of venous blood is achieved through a catheter 3–6 mm in diameter [1], introduced into the right atrium through the right jugular vein. To prevent the venous catheter from being sucked against the walls of the superior vena cava and right atrium, the venous receiver [2] is fitted with a control valve preventing the pressure from falling below −80 to −100 mm Hg. The remaining units of the apparatus are assembled in the usual manner. The system of venous drainage described above provides for a volume velocity of the artificial circulation of the order of 80–100 ml/kg/min during resuscitation of dogs weighing 5–15 kg, either with complete or partial replacement of the normal circulation. By reducing and increasing the diameter of the catheters, the feed tubes, and the power of the oxygenator, the design as described can clearly be modified for the resuscitation of objects weighing less than 5 kg or more than 15 kg.

LITERATURE CITED

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