CONTINUOUS METHOD OF RECORDING THE HUMAN BLOOD PRESSURE

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A no-contact method of recording the arterial blood pressure continuously in man, using the "Pul's-10" venous pulsograph, is suggested.

KEY WORDS: arterial blood pressure; no-contact recording method; function test.

In investigations on man it is often necessary to monitor the arterial blood pressure continuously, especially during function tests. Korotkov's method and the oscillographic method do not enable this to be done.

The writers suggest a no-contact method of recording the diastolic pressure continuously in the human brachial artery. The pressure in the sphygmomanometer is recorded by continuous monitoring of the region of disappearance of Korotkov's sounds in the artery. A no-contact method is used to record the pressure from the sphygmomanometer. For this purpose the "Pul's-10" no-contact venous pulsograph, model 0.97 (Krasnogvardeets Factory), intended for continuous phlebography, is used. The action of this apparatus is based on the principle of continuous change of electrical capacitance formed by the part of the body studied and the receiving element of the transducer. To record the pressure, modifications were introduced into the scheme of the apparatus. As a result it was converted into a constant voltage detector, giving a signal of about 1 V. Depending on changes in capacitance, this voltage is changed at the input of the detector by ±0.2 V, and the change is balanced by a device illustrated schematically in Fig. 1. The pressure is recorded on the USCh8-03 ink-writing apparatus using the cascade of the BPU4-01 dc amplifier.

The suggested method is based on the principle of continuous measurement of the electrical capacitance formed by the column of mercury in the manometer and the receiving element of the transducer. The receiving element of the transducer is made of a metal plate measuring 0.5 × 10 cm, placed alongside the glass tube of the sphygmomanometer. As the level of mercury in the manometer changes, so does the electrical capacitance of the system. The suggested method of recording pressure is a no-contact method be-

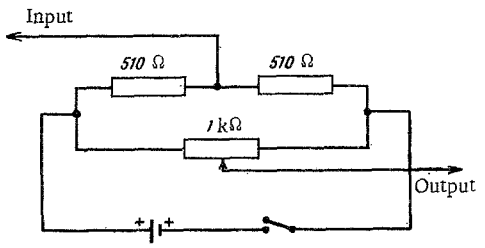

Fig. 1. Scheme for matching the "Pul's-10" apparatus with the BPU4-01 dc amplifier (explanation in text).

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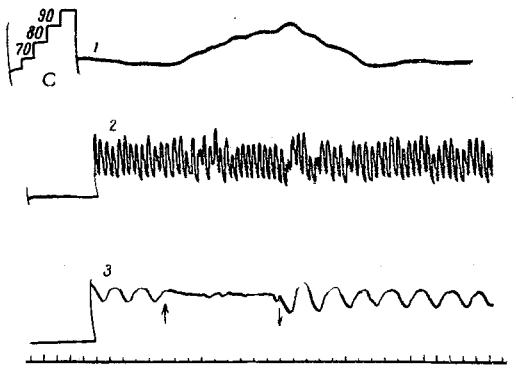

Fig. 2. Record of changes in diastolic pressure in human brachial artery during breath holding: 1) diastolic pressure, 2) sphygmogram of carotid artery, 3) pneumogram, C) calibration of system. Arrow upward shows beginning of breath holding, arrow downward shows end of breath holding. Paper-winding speed 2.5 mm/sec.

cause there is no contact between the receiving element of the transducer and the mercury column in the manometer. Hitherto, in order to record pressure from a mercury manometer electrically, a contact rod or wire has always been lowered into the mercury [1, 2].

This method can also be used to record pressure from a U-shaped mercury manometer in experiments on animals in order to record the arterial pressure directly by the electrical method. In this case there is no need to lower a contact graphite rod [2] or nichrome wire [1, 3] into the mercury in the manometer. Contact wires or rods do not always ensure reliable contact with the mercury and they have to be washed periodically [2]. The suggested system is stable in operation and gives linear readings. A record of the change in diastolic pressure in the human brachial artery during breath holding is given as an example (Fig. 2).

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