

## METHODS

### VENOUS PULSE SENSORS FOR RECORDING THE SPHYGMOGRAM

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An apparatus for recording the sphygmogram by means of a venous pulse sensor from a type 6NEK-IF<sub>2</sub> apparatus is described.

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VP-1 venous pulse sensors of the 6NEK-IF<sub>2</sub> electrocardiograph differ from arterial pulse sensors in that they exert virtually no pressure on the vessel, because their contact ball is made of very thin plastic "loop," and is therefore unsuitable for recording sphygmograms.

So that venous pulse sensors can be used to record sphygmograms, a supplementary system has been made for transmitting oscillations of the arterial wall to the venous pulse sensor. If this system is connected to the venous pulse sensor (Fig. 1) sphygmograms can then be recorded.

The supplementary system for transmitting oscillations of the arterial wall consists of two Marey's capsules: a receiving (RC) and a recording (C) capsule, a connecting tube and balloon (B). A rubber membrane is fixed to the receiving capsule and a rubber or thin metal membrane to the recording capsule.

The receiving capsule is secured above the artery, and a pressure created in the system by means of the balloon (10-

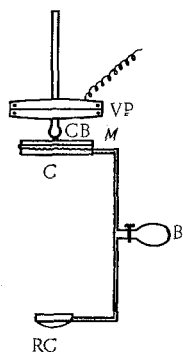


Fig. 1. Diagram showing method of connecting venous pulse sensor to supplementary system for transmitting arterial wall oscillations. VP) Venous pulse sensor; CB) contact ball; C) recording capsule; M) membrane; B) balloon; RC) receiving capsule.

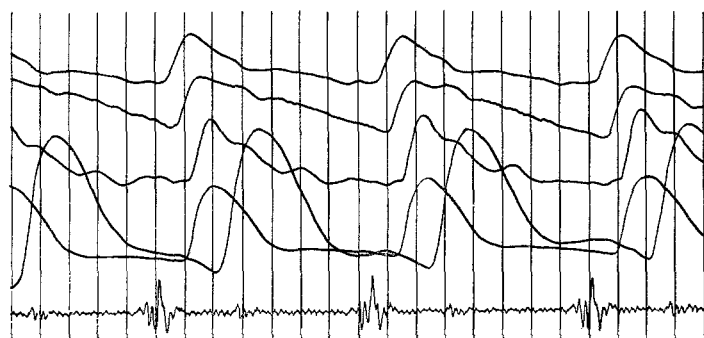


Fig. 2. Sphygmograms and phonocardiogram recorded synchronously on a 6-channel electrocardiograph. From top to bottom: sphygmograms of common carotid, temporal, radial, femoral, and dorsalis pedis arteries and phonocardiogram. Sphygmogram of temporal and dorsalis pedis arteries recorded by venous pulse sensor (VP-1), remaining sphygmograms by normal sphygmographic sensors.

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30 mm Hg). The membrane of the receiving capsule exerts a pressure on the artery, so that its pulsation can be detected. Pulsation of the arterial wall is transmitted from the receiving capsule to the recording capsule. The contact balls of the venous pulse sensor, which in this case receives transmitted pulsations of the arterial wall, is in contact with the membrane of the recording capsule. To record the pulse volume, instead of the receiving capsule the cuff from a Riva-Rocci apparatus is connected.

By the use of venous pulse sensors to record the sphygmogram in conjunction with the ordinary sphygmographic sensors, the 6-channel electrocardiograph could be adapted for polysphygmography: synchronous recording of sphygmograms of the temporal, common carotid, radial, femoral, and dorsalis pedis arteries (Fig. 2).

The value of polysphygmography is that it enables the state of the walls of different arteries to be assessed under absolutely identical conditions.

The suggested method of using venous pulse sensors to record the sphygmogram requires no changes in the construction of these sensors, and when the need arises they can therefore be used also to record phlebograms.