An improved valve device for the continuous measurement of arterial blood pressure in the conscious unrestrained cat

Thuránszky (1966) described a simple method for the measurement of arterial blood pressure in the conscious unrestrained cat consisting of a plastic catheter inserted into the common carotid artery which after plugging, was exteriorized, led around the neck like a collar and held in position with adhesive plaster. The danger of the catheter pulling out and the difficulty of making a satisfactory connection to the recording device were overcome by Hall, Gomersall & Heneage (1967) who used a one-way valve made from Perspex and screwed into the skull.

Whilst relatively effective, in our hands, this gave rise to several difficulties which suggested that further development was desirable.

Day & Owen (1970) screwed the arterial valve to a rectangular Perspex base which was sutured, via small holes in the corners, beneath the skin at the back of the neck. This allowed side-to-side movement of the valve and reduced the risk of it becoming dislodged from the catheter it also seemed to be more acceptable to the cats than the system of Hall & others.

We have now further modified the arterial valve arrangement in the following ways; the whole valve and base is constructed from a single piece of polytetrafluoroethylene (PTFE) which has virtually abolished the sloughing of the skin at the base of the valve which occurred regularly using Perspex valves. The valve base is now rounded thus doing away with sharp corners as used by Day & Owen (1970). The height of the valve

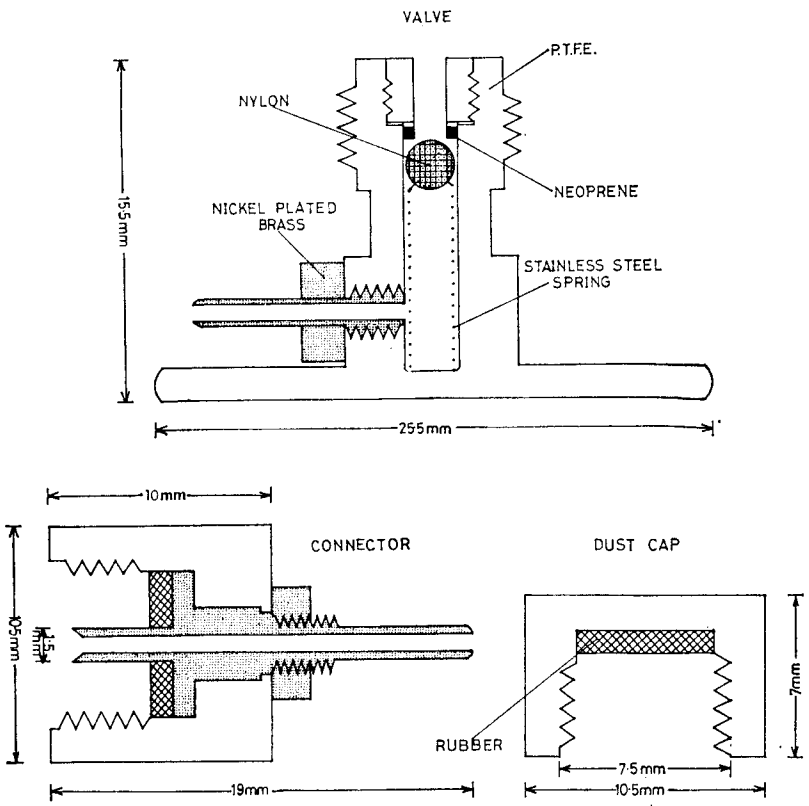

FIG. 1. Blood pressure valve device; cross-sectional diagram illustrating valve, connector and dust-cap.

has been increased over that described by Hall & others (1967); this facilitates connection to the recording device and has enabled flat grooves to be incorporated on either side of the valve body so that it may be firmly held with forceps whilst making or breaking the valve connection, and also reduces the strain put upon the surrounding skin areas.

The tendency for the valve to seep after prolonged use has been abolished by increasing the length of the stainless steel spring and by replacing the steel ball and rubber washer used by Hall & others (1967) by a nylon ball and a neoprene washer.

The device as described together with the dust-cap and connector are illustrated in Fig. 1. It has been used by us without serious problems for periods up to six months and has enabled long-term observations on cardiovascular responses to be measured.

The valve arrangement is now available commercially from Messrs. Scientific and Research Instruments Ltd., 335 Whitehorse Road, Croydon, Surrey to whom we are very grateful for their patient help in its development.

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