A CIRCULATORY THERMOSTAT USED WITH THE BENTLEY OXYGENATOR
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At the Montreal General Hospital, in the Department of Cardiovascular and Thoracic Surgery, we have been using the Bentley Temptral Oxygenator for the last six weeks. As you know, when using the heat exchanger of the Bentley Oxygenator, one needs a water safety assembly as well as water hoses and the usual connection equipment. Lately, we have been using a thermostatically-controlled water circulator, like those used on constant-temperature water baths, instead of the previously used equipment.

The circulating pump is ideal for maintaining normothermia for any length of time. All one needs to operate the apparatus are two lengths of tubing measuring approximately 36” and 2 liters of water.

The circulatory pump is called Haake, and is supplied by Fisher Laboratories. Other models are available from other sources.

Normothermia being used on all our operative cases, no data is yet available on the efficiency of the apparatus using hypothermia. Since the pump pressure is approximately 2 psi, and the pumping capacity is only 10 liter/min., its efficiency to reawarm could be less than the usual heat exchanger, but for maintaining normothermia, it is ideal.

The Pump is very compact, its dimensions being 11” x 8” x 5”, and its weight 4.8 Kgms.

Perfusion with Morphine Anesthesia

Morphine sulfate is being widely used as the chief anesthetic agent during cardiac surgery. It maintains a good degree of analgesia at a lighter plane of anesthesia. During the perfusion of patients anesthetized with morphine, oxygen consumption by the patient may increase greatly resulting in lower than normal pO2 that may be difficult to correct.

This excessive oxygen consumption is due, more than likely, to muscular tension and/or “micro-shivering”. We have found that increased curarization to increase muscle relaxation will usually reduce this excessive oxygen consumption and allow us to bring our pO2 readings back to normal.

Another effect of morphine is an initial dilatation of the blood vessels, primarily in the periphery. Eventually, after an unspecified amount of time and a few supplemental doses of morphine, blood flow and arterial pressure measurements indicate that the peripheral vascular bed seems to react in an opposite manner. The peripheral vessels begin to constrict. Where a low mean arterial pressure was evident earlier in the perfusion, it may now being to rise to 125, or more, millimeters of Mercury. As comforting as such a rise in perfusion pressure may be, the tissues still may not be adequately perfused. Small (1 milligram) increments of Thorazine are useful in opening up the constricted peripheral vascular bed. This will be evident in a reduced arterial pressure and will result in better tissue perfusion.

The monitoring of patient blood volume while on bypass is quite necessary. The central venous pressure will give a good indication of volume. A constricted vascular bed will require a lower volume of blood to fill the circulatory system while a dilated condition will require a greater volume as well as an increased blood flow. An adequate perfusion not only requires open blood channels but the maintenance of normal central venous and mean arterial pressures which, in turn, relate to blood volume and flow.

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OXYGENATION