SLACO DIVISION

HALLIKAINEN

BRAMSON MEMBRANE HEART-LUNG MACHINE

Model 1432

The Bramson Membrane Heart-Lung Machine has been developed by the Institute of Medical Sciences at the Presbyterian Medical Center, San Francisco, California.

It is in routine clinical use at that Center, for extra-corporeal circulation during open-heart surgery.



Because the membrane lung, which forms an integral part of the unit, avoids the large areas of raw blood-gas interfaces associated with bubble, screen, disc or other filming oxygenators, less damage is inflicted on the blood per unit time. Specifically, there is less denaturation of plasma proteins, less hemolysis and less platelet destruction. Moreover, all measured metabolic parameters have shown signficantly improved mean values.

nstruments

BIOLOGICAL and MEDICAL

For these reasons (and others enumerated below) patients perfused with this equipment have, in the opinion of the attending physicians, been more vigorous and in general, done better than the average patient perfused with conventional oxygenators; the differences have been most pronounced when comparing perfusions of long duration. (5 to 6 hours).

Experimental and clinical evidence is accumulating that this equipment will permit prolonged circulatory support (24 - 36 hours or more) by partial perfusion, for the treatment of acute pulmonary and/or cardiac failure.

SPECIAL FEATURES OF THE BRAMSON MEMBRANE LUNG

- Adequate and balanced exchange of oxygen and carbon dioxide;
- 2. No raw blood-gas interfaces;

- 3. Low Priming Volume (1 liter for the adult size);
- 4. Inherently constant blood volume;
- 5. Low hemodynamic resistance (about 25 millimeters Hg. at 3 liters/min. at 34°C.)
- 6. Negligible hemolysis;
- 7. Only one (1) pump is needed for the perfusion circuit;
- 8. The lung embodies integral heat exchange permitting rapid temperature changes (more than ½°C per minute for a large adult);
- 9. All parts in contact with blood are disposable (except five (5) stainless steel bolts);
- 10. Membranes are robust and precision die-cut;
- 11. All membranes are pretested, and are free from pinholes;
- 12. By pretesting the lung any instance of faulty assembly can be eliminated;
- 13. The lung can be processed and tested in three hours;
- 14. In clinical use the lung has proved completely reliable.

DESCRIPTION OF THE UNIT

The complete equipment constitutes an integrated system for safe, accurate and physiologically adequate extracorporeal circulation. It comprises the following.

- 1. One single roller, fully occlusive arterial pump (flow rate up to 5 liters/minute).
- 2. A 14 cell Membrane Lung with 5.6 square meters effective diffusion area.
- 3. A disposable blood filter and bubble trap.
- 4. A disposable (plastic) control bladder or "atrium" receiving the venous blood from the patient.
- 6. A water circulating and automatic pressurizing system which maintains constant pressure difference between blood and water cells in the lung.**
- 7. A heat exchange system permitting the highest desired rates of cooling or rewarming of the patient.
- 8. Three single roller suction pumps for returning cardiotomy blood to the circuit.
- 9. All necessary automatic and manual controls.
- 10. Full instrumentation including alarm systems.

NOTE: Coronary perfusion equipment can also be supplied but is not a standard accessory.

THE COMBINED EFFECT OF THE "CLOSED" BLOOD CIRCUIT, INHERENTLY CONSTANT BLOOD VOLUME AND AUTOMATIC PUMP SPEED CONTROL IS TO SIMPLIFY GREATLY THE TASK OF THE MACHINE OPERATOR.

**This unique feature is responsible for a.) low blood volume; b.) constant blood volume; c.) protection of membranes against stress and rupture; d.) outstandingly powerful heat exchange.