Experience Summary for Open Heart Surgery

A recent survey by William G. Esmond, M.D., assistant professor of surgery at the University of Maryland Medical School has resulted in a summary of equipment performance and efficiency in 38,629 cases of open heart surgery performed at 63 medical centers.

Dr. Esmond is continuing his research in this area and is interested in any additional or unusual case facts. He can be written in care of the University of Maryland Medical School, Baltimore, Maryland 21201.

1) Years experience of your hospital in open-heart surgery. Years 8.44

2) Total bypass performed using heart-lung machine bypass. 633.2

3) Do you have emergency power electrical equipment on hand to supply emergency electrical power in the event of a power failure? Yes 60 No 3

4) Is this equipment in the—
   Operating Room 8
   Outside the Operating Room 8
   Hospital Emergency System 43
   None 4

5) How many of the cases in (2) have had electrical power failure? 45

6) Have any fatalities resulted from electrical power failure? (One said not in surgery.) 0

7) Any mechanical failures? (One incorrect gasket caused air embolism.)
   a) Components of pump itself
      1) Electric motor drive Number 22
      2) Electric motor control circuit Number 8
      3) Miscellaneous—plugs, wires, etc. Number 11
      4) Cut blood circuit tubing Number 13
   b) Oxygenator failures
      1) Inadequate oxygenation Number 94
      2) Inadequate debubbling Number 28
      3) Inadequate CO₂ transport Number 6
   c) Heat exchange inadequacy
      1) Inability to prevent hypothermia Number 10
      2) Inability to adequately rewarm from hypothermia Number 11
   d) Open heart suction inadequacy
      1) Inadequate suction Number 212
      2) Failure due to debris blocking filters Number 49
      3) Inadequate air-blood separation Number 20
   e) Has red cell hemolysis, white cell, or platelet destruction been a serious problem in your experience? Yes 8
   f) Has protein denaturation been proved to be a serious problem in your experience? Yes 1

8) Method of handling mechanical failures
   a) Hand cranking Number 57
   b) Flexible shaft variable speed drive from spare standby motor and controller Number 3
   c) Standby second machine assembled, sterile and primed Number 2
   d) Other — Battery operated pump Number 1

9) Do you consider the reliability of your present equipment adequate? Yes 61 No 2

Data from 63 centers totaling 38,629 cases.