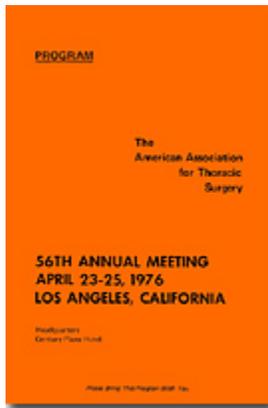


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## FRIDAY MORNING, APRIL 23, 1976

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# American Association for Thoracic Surgery 56th Annual Meeting Scientific Program

FRIDAY MORNING, APRIL 23, 1976

**8:30 A.M. Business Session (Limited to Members)**

**Los Angeles Ballroom**

**8:45 A.M. Scientific Session**

**Los Angeles Ballroom**

### **1. Pulmonary Artery Conduits in Infants Under Six Months of Age**

PAUL E. EBERT, SAUL J. ROBINSON\*, PAUL STANGER\*

and MARY ALLEN ENGLE\*, San Francisco, California and

New York, New York

Nine infants with complex congenital anomalies, four with either Type I or II truncus arteriosus, and five with various forms of pulmonary atresia have undergone corrective surgery to separate the systemic and pulmonary circulations with reconstruction of right ventricular-pulmonary artery continuity, using either a human aortic allograft or a dacron conduit with a Porcine valve. The infants weighed between 2.3 and 4.3 kilograms and were between 2 and 17 weeks of age. In all nine the ventricular septal defect was closed and an atrial septal defect repaired in two. Eight of the nine have survived the operative procedure.

Postoperative catheterization in six have shown conduit pressures as high as two-thirds systemic with some restriction at the site of distal anastomosis. Cardiac output has been normal and pulmonary vascular resistance has not

been elevated. One operative fatality was due to irreversible pulmonary hypertension. Profound hypothermia with or without total circulatory arrest was used in all nine infants. The differences in technique of hypothermia employed as well as the technical aspects of attachment of the graft to the delicate small right ventricular chamber will be discussed. Low mortality and optimistic postoperative hemodynamic measurements lend encouragement to early separation of the circulation as a better means of palliation in infants with truncus arteriosus to reduce the likelihood of pulmonary vascular disease.

\*By invitation

## **2. Microporous Expanded Polytetrafluoroethylene Arterial Prosthesis for Construction of Aorta-Pulmonary Shunts in Cyanotic Infants**

ALAN B. GAZZANIGA, Irvine California

JOHN J. LAMBERTI\*, Chicago, Illinois

RALPH D. SIEWERS\*, Pittsburgh, Pennsylvania

DONALD R. SPERLING\* and WILLIAM R. DIETRICK\*, Irvine, California

RENE A. ARCILLA\* and ROBERT L. REPLOGLE, Chicago, Illinois

Despite improved results with early correction of congenital heart anomalies in cyanotic infants, certain lesions are not amenable to immediate repair. Systemic to pulmonary artery shunts are necessary for survival in some cases. The traditional shunt operations have involved direct anastomosis of the aorta or sub-clavian artery to the right or left pulmonary artery; and while these operations are life saving, significant immediate and long-term complications can occur.

A microporous expanded polytetrafluoroethylene PTFE 4.0 mm arterial prosthesis was used to construct aorta-pulmonary shunts in 10 infants, ages 1 to 180 days (28 days) weighing from 2.0 to 5.0 kg (3.1 kg). Nine patients had pulmonary atresia, one had tricuspid atresia, all had associated intracardiac defects and were severely cyanotic with arterial oxygen saturations below 70%. Nine of the 10 patients underwent emergency surgery. The graft was anastomosed from aorta to the main pulmonary artery in 8 infants, to the right pulmonary artery in one, and to the left pulmonary artery in one. Nine of 10 patients survived the operation. The shunt was patent at necropsy in one patient who died a week post-operatively secondary to an intracranial hemorrhage. The 8 remaining patients are alive and well 2-6 months (3.3 mos.) postoperatively. All infants have functioning shunt murmur, are gaining weight, and are acyanotic at rest.

The desirable features of aorta to main pulmonary artery shunts using the PTFE prosthesis are rapid performance, minimal lung retraction at surgery, bidirectional and uniform flow to the pulmonary arteries, potential ease of subsequent closure, expected equal growth of both pulmonary arteries, accurate size of the anastomosis, and autogenous vessels are not sacrificed (Blalock). Results thus far indicate that use of the PTFE prosthesis in infants is practical and safe.

\*By invitation

## **3. Optimal Age for Primary Repair of Ventricular Septal Defect**

EUGENE H. BLACKSTONE\*, JOHN W. KIRKLIN, ALBERT D. PACIFICO\*,

AZAI APPELBAUM\*, and LIONEL M. BARGERON\*, Birmingham, Alabama

Our experience with 1) primary repair for ventricular septal defect (VSD) from 1967 to April 1975 (190 patients (pts)) has been studied in combination with 2) late results of an earlier experience reported in the literature (75 pts), by a method of joint probability analysis, to determine currently the optimal age and techniques for primary closure of VSD under a variety of anatomical and hemodynamic circumstances, and to identify problem areas where future improvements are needed.

1) 165 pts (86.8% of the 190) had a single VSD. Hospital mortality was 4.8%. At age <6 months (mos), it was 27.3%; 6-12 mos, 20%; 12-24 mos, 5.3%; over 24 mos. 0.8%; with mean pulmonary pressure (PAP) less than 25 mmHg, it was 1%;

between 25 and 50, 6.8%. Significant residual L-R shunting occurred in 3 pts, with incidence not related to age at repair. One patient (age 16 years) developed heart block. Surgical techniques varied, and their effects have been analyzed.

2) Re-analysis of the published data indicates that pts with severe pulmonary hypertension age 2 years (yrs) or less at repair had 3% probability of PAP>35 mmHg 5 yrs or more after repair; age 2-5 yrs at repair, 38%; >5 yrs, 52%. All pts with PAP <35 mmHg at time of repair had 2% probability of PAP>35 mmHg 5 yrs later; with PAP 35-50 mmHg, 17%; >50 mmHg, 41%.

The joint probability analysis of 1) and 2) indicates that the probability of surviving operation and having PAP < 35 mmHg 5 yrs later is in general greatest when operation is performed at age 17.5 mos; however, the higher PAP preoperatively, the lower the age for minimizing this risk (at PAP of 35 mmHg, 20 mos; at 50 mmHg, 15 mos; at 70 mmHg, 12 mos). Similar analyses involving additional factors, including multiplicity of VSD, have identified optimal age and techniques for repair in a variety of individual types of pts with VSD, and problem areas requiring further study.

\*By invitation

#### **4. Anatomic Correction of Transposition of the Great Arteries**

ADIB D. JATENE\*, V. F. FONTES\*, P. P. PAULISTA\*,

L. C. B. de SOUZA\*, F. NEGER\*, M. GALANTIER\* and

J.E.M.R. SOUZA\*, Sao Paulo, Brazil

Sponsored by E. J. Zerbini, Sao Paulo, Brazil

The authors present a new approach for anatomical correction of transposition of the great arteries. The two coronary arteries with a piece of aortic wall are transposed to the posterior artery. The two aortic openings are closed with a patch. The aorta and pulmonary artery are transected, contraposed and then anastomosed. The interventricular septal defect is closed with a patch through a right ventriculotomy because the right ventricle is no longer systemic.

Two patients aged 3 months and 40 days weighing 4,200 and 3,700 g respectively were operated on with deep hypothermia and total circulatory arrest. There was good recovery from the operation with normal cardiocirculatory conditions. The first patient developed renal failure and died on the third postoperative day. During this time the cardiocirculatory conditions were good. The second patient made an uneventful recovery. The hemodynamic study 20 days after surgery showed the complete correction of the malformation. Five and a half months after operation, he weighs 7,500 g and the evolution is very good.

The authors believe that this operation will be reproducible by most of cardiovascular surgeons and will be an alternative to the Mustard procedure, specially to those patients with interventricular septal defect and pulmonary hypertension.

#### **INTERMISSION - VISIT EXHIBITS**

\*By invitation

#### **5. Intra-operative Atrial Activation Mapping Before, During and After Mustard Operation**

MARC R. deLEVAL\*+, JOHN H. WITTIG\* and

JAROSLAV STARK\*, London, England

Sponsored by Aldo Casteneda, Boston, Massachusetts

Thirty-two patients with transposition of the great arteries underwent 35 point bipolar epicardial and endocardial mapping during four stages of the Mustard operation in an endeavour to determine the electrophysiological basis of the postoperative supraventricular arrhythmias associated with this operation. Comparisons were made between atrial activation patterns and times before and after each of the following stages: 1. cannulation of superior vena cava (SVC), 2. atriotomy, 3. excision of the atrial septum, 4. placement of interatrial baffle. SVC was cannulated directly 1-2 cm above

the right atrial (RA) - SVC junction or through the body of RA appendage. The interatrial septum was excised in all patients. The coronary sinus was cut back in 11 patients and left intact with suture line behind it in 16 patients, pericardial baffles were then inserted. During stage 1, eleven patients underwent epicardial mapping. No significant difference in atrial activation was noted with either technique of cannulation. The effect of atriotomy was evaluated with epicardial and endocardial mapping in all thirty-two patients. Atriotomy did not lengthen atrial activation times ( $66.1 \pm 6$  msec) but significantly altered atrial activation over the posterior septum in 25 patients. In seven patients, the earliest area of atrial depolarisation shifted from its superior vena caval position to the crista supraventricularis prior to atriotomy or cannulation. Atriotomy in these patients lengthened atrial activation  $25.1 \pm 6.3$  msec. In one of these seven patients atriotomy transected the area of earliest depolarisation on the crista. Post-operatively this patient developed bouts of paroxysmal atrial tachycardia. Stage 3 did not produce significant changes in atrial activation times or directions. During stage 4, eleven patients were evaluated with coronary sinus cutbacks and baffle placement and 16 patients with just baffle placement. Atrial activation times were unchanged in all patients with coronary sinus cutback, but the direction of atrial activation was across the anterior septa) region due to conduction delays over the middle and posterior septum. One patient manifested 1st degree heart block in CS cutback group when slowed conduction was mapped in the anterior septal area.

†Dr. deLeval was the 24th Everts A. Graham Memorial Traveling Fellow (1973-1974).

\*By invitation

## 6. Nonoperative Closure of Left-to-Right Shunts

NOEL L. MILLS and TERRY D. KING\*, New Orleans, Louisiana

Efforts to close left-to-right shunts at Ochsner Foundation Medical Center have been directed toward ASD and PDA.

PDA's were constructed in dogs by interposing a segment of jugular vein between the aorta and main pulmonary artery. Five dogs which had PDA's closed by a plug device through the femoral vessels were sacrificed at 6 to 12 months. Histologic section showed good fibrous ingrowth into the polyurethane foam with endothelial covering on aorta and pulmonary artery ends. There were no migrations and no residual shunts.

Twelve patients had ASD's sized and located as to position at the time of cardiac catheterization. Sizes ranged from 13 mm. to  $> 40$  mm. Five patients had centrally positioned secundum ASD's closed with double umbrella devices, 25 to 35 mm. in diameter. Seven patients were found at catheterization to have contraindications for umbrella closure (anomalous pulmonary venous return, 2; large inferior or superior secundum ASD, 2; common atrium, 1; sinus venosus ASD, 1; associated VSD, 1). ASD size and location of those who underwent operative closure were compared to measurements at catheterization, and variation was insignificant.

Follow-up studies from two to six months on five patients with umbrella closure has revealed no hemolysis, arrhythmias, thromboembolism, migration or other untoward effects.

### 11:15 A.M. Presidential Address

#### "THE CHALLENGE OF PROGRESS"

David J. Dugan

\*By invitation

## FRIDAY AFTERNOON, APRIL 23, 1976

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FRIDAY AFTERNOON, APRIL 23,  
1976

## 2:00 P.M. Scientific Session

Los Angeles Ballroom

### 7. Psychomotoric and Intellectual Development after Deep Hypothermia and Cardiac Arrest in Early Infancy

B. J. MESSMER\*, U. SCHALLBERGER\* and S. SENNING,

Zurich, Switzerland

The uncertainty about the late effects of deep hypothermia and cardiac arrest remains a persistent threat when the method is used for total correction of congenital heart disease in early infancy.

Total correction of VSD, TGA, TAPVR and AS has been achieved in selected cases mainly during the years 1968 and 1969 with surface induced hypothermia. Cardiac arrest varied from a minimum of eight to a maximum of 61 minutes at temperatures between 20°C and 25°C in eleven nonselected patients who could be studied three to ten years after surgery. Their medium age at operation was 3 months (1 week to 23 months). Late evaluation consisted of the actual cardiac and physical status. Special psychologic test series were employed to define the psychomotoric and intellectual status of these children.

The operative result was good in all children. The verbal and the nonverbal intelligence expressed by the corresponding I.Q. showed that eight children are within the normal range or even above while three children are below. A simultaneous comparison to a matched group of children who had cardiovascular surgery during early infancy under normo- or slight hypothermia has not shown any significant difference in intellectual behavior.

Deep hypothermia and cardiac arrest thus does not seem to have negative influence to the late psychomotoric and intellectual development. A correlation, however, seems to exist between age and body weight at the time of operation and intellectual development. The older the infant is at the time of surgery the smaller will be the chances of normal intellectual development.

\*By invitation

## **8. Acute Clinical Hypocalcemic Myocardial Depression During Rapid Blood Transfusion and Postoperative Hemodialysis: A Preventable Complication**

GORDON N. OLINGER\*, CHRISTOF HOTTENROTT\*,  
DONALD G. MULDER, JAMES V. MALONEY, JR. and  
GERALD D. BUCKBERG, Los Angeles, California and  
Heidelberg, Germany

Despite experimental evidence that acute myocardial depression resulting from rapid transfusion of ACD blood (citrate binds ionic calcium) is avoidable by simultaneous calcium administration, most hypovolemic patients receive calcium either after transfusion or not at all. Similar iatrogenic hypocalcemic myocardial depression occurs in normovolemic patients dialyzed for acute uremia secondary to low postoperative cardiac output when ACD blood prime is used at high initial flow rates (350 cc/min) and when dialysis is performed against low calcium dialysate (2.5mEq/l).

This study tests the hypotheses that 1) rapid blood transfusion (ACD or CPD) is safe if calcium is given simultaneously, 2) addition of calcium to dialysis heparinized blood prime prevents initial depression, 3) hemodynamic instability during dialysis is prevented when the dialysate is normocalcemic, and 4) depressive effects of ACD and CPD blood are similar.

In 9 hypovolemic but stable patients (pre-cardiopulmonary bypass for coronary revascularization - blood shed during sternotomy but not replaced) equal vol-(500cc) of CPD + heparin blood and of CPD + heparin + calcium blood were transfused at 2cc/kg/min in random order and cardiac output (electromagnetic flow probe), arterial pressure, and left atrial pressure were monitored continuously. Recalcified blood transfusion augmented cardiac work 76%. This normal function curve was depressed markedly by transfusion of non-recalcified blood; there was 42% less cardiac work ( $P < 0.0005$ ) at a 30% greater left atrial pressure ( $P < 0.005$ ). In 10 post-cardiac surgery dialysis patients conversion to normocalcemic dialysate (4.0mEq/l) and addition of calcium to blood primes prevented cardiac depression and hemodynamic instability.

We conclude 1) acute myocardial depression with CPD blood is similar to ACD blood and is

prevented during transfusion of both by simultaneous calcium administration, and 2) hemodialysis in post-cardiac surgery patients is safe if calcium is added to blood prime and dialysis is made normocalcemic.

\*By invitation

## **9. Preoperative Assessment of Esophageal Pathology**

ROBERT D. HENDERSON\* and F. GRIFFITH PEARSON,  
Toronto, Canada

Panmural esophagitis results in esophageal thickening and shortening and prevents adequate reduction of a hernia. Twenty patients with panmural esophagitis, treated by Belsey repair, have been followed more than 5 years, 9 remain asymptomatic, 11 have symptomatic reflux and 7 have required further surgery. Belsey also has reported a 45% recurrence rate in this type of patient.

Preoperative recognition of panmural esophagitis allows a planned surgical approach, and the use of a surgical technique designed for the management of an ir-reducible hernia. The ability to predict these changes were studied in 124 patients, who were evaluated by history, radiology, endoscopy and manometry prior to transthoracic hernia repair. The esophagus was inspected at operation to determine the presence of panmural changes. History was of no value in assessment. Radiologically a large and irreducible hernia was associated with panmural changes, but these changes also occurred in the absence of ulceration. Manometric studies allowed accurate prediction of mural changes. Over 90% of patients with pan-mural esophagitis have more than 40% distal disordered motor activity (D.M.A.) and 75% more than 60% D.M.A. Combining these investigative data, an accurate prediction of panmural changes was possible in 90% of the 124 patients.

\*By invitation

## **10. Operative Management of Acid Peptic Esophageal Strictures**

LUIS H. TOLEDO-PEREYRA\*, GUILLERMO  
MANIFACIO\*,

LYLE D. JOYCE\* and EDWARD W. HUMPHREY,  
Minneapolis, Minnesota

From 1960 to 1973, 88 patients with an acid-peptic stricture of the esophagus were seen. Of these,

56 patients were treated by dilatation and medical therapy only, while 32, all medical failures, underwent operative therapy followed by esophageal dilatation. In 26 of the 32 patients, esophagitis was described on the endoscopic examination. Sixteen patients had a high gastric acid secretory rate<sup>^</sup> and 12 patients also had a history of a duodenal ulcer. Thirteen patients had only a hiatus hernia repair, 10 had a hiatus hernia repair plus a vagotomy and pyloroplasty or a gastric resection without hiatus hernia repair, and 2 had a colon interposition. The most common hernia repair was a Nissen or Belsey type. An average of 4 postoperative dilatations to size 45 French over a period of 2Vi months was required to obtain satisfactory swallowing. Patients that underwent a hiatus hernia repair plus a vagotomy and pyloroplasty had a greater duration of symptoms prior to surgery than did those patients having only a hiatus hernia repair. In addition, 5 patients in the hiatus hernia repair plus vagotomy group had had significant pre-operative bleeding whereas none of the group having only a hiatus hernia repair had bled, yet no postoperative differences were observed between these 2 groups. The initial results (6 months) of all patients undergoing operative therapy were: poor, 6; good to excellent, 26. Of the 26 having an initial satisfactory result, only 2 have had a subsequent recurrence of symptoms and required further dilatation. Most patients with acid-peptic esophageal strictures respond adequately to a hiatus hernia repair plus an acid reducing operation. The necessity for replacing the esophagus in this condition is rare.

## **INTERMISSION - VISIT EXHIBITS**

\*By invitation

### **11. The Effect of Positive End-Expiratory Pressure on Regional Ventilation and Perfusion in the Normal and Injured Primate Lung**

JOHN W. HAMMON, JR.\* , WALTER G. WOLFE\* , JON F. MORAN\* ,

ROBERT H. JONES\* and DAVID C. SABISTON, JR.,  
Durham, North Carolina

Although positive end-expiratory pressure (PEEP) is being employed in the management of respiratory insufficiency, many of its physiologic effects remain undetermined. The cardiopulmonary effects of 0, 5, 10, and 15 cm PEEP were studied in 10 tranquilized baboons ventilated at 15 ml/kg with room air. Hemodynamic measurements, analysis of arterial and expired gases were done, and pulmonary ventilation and blood flow ratios (V/Q) determined using <sup>133</sup>Xe and a Baird-Atomic 70 Scanning Gamma Camera. V/Q ratios were computed in three lung

zones: upper zone (Z I), middle (Z II), and lower (Z III). These measurements were repeated after injection of .06 - .08 mg/kg oleic acid into the right atrium.

In the normal lung, there was significant improvement in oxygenation at 5 cm PEEP ( $pO_2$  83.3  $\pm$  3.1  $\pm$  92.3  $\pm$  2.4)\* secondary to improved ventilation of Z III (V/Q .81  $\pm$  1.00)\*, but PEEP greater than 5 cm produced increasing mismatch of ventilation and perfusion. The V/Q data were: Z I 5 PEEP - 1.42  $\pm$  15 PEEP -1.95\*; Z II 5 PEEP 1.12  $\rightarrow$ 15 PEEP 1.22; Z III 5 PEEP 1.00  $\pm$  15 PEEP 1.24\*.

After injection of oleic acid, shunting was evident at low levels of PEEP due to a shift of perfusion to Z I (V/Q .85)\*. This mismatch of ventilation and perfusion was corrected in all three zones at 15 cm PEEP. V/Q data were: Z I 0 PEEP -.85  $\pm$  15 PEEP - 1.1\*; Z II 0 PEEP - 1.22  $\pm$  15 PEEP 1.21; Z III 0 PEEP - 1.23  $\pm$  15 PEEP- 1.01.\*

From these data, it is concluded that the use of PEEP in the injured lung has a beneficial effect by balancing regional ventilation and perfusion in addition to increasing functional residual capacity. Mechanisms of lung injury and pre-injury status of cardiopulmonary function remain critical in determining the effect of PEEP on hemodynamics as well as the pattern of regional ventilation and perfusion.

\*(P<.05)

\*By invitation

## 12. Prosthetic Reconstruction of the Trachea and Carina

WILLIAM E. NEVILLE and PAUL J. P. BOLANOWSKI\*,  
Newark, New Jersey

While it is generally agreed that a primary anastomosis of the tracheobronchial tree is preferable following resection, there are occasions when this is impossible because of the extent of the disease. Thus if airway continuity is to be restored, one is obligated to use an alternative method. Following extensive laboratory investigations, during the past 4½ years, twenty-six patients with tracheal stenosis due to benign stricture and malignancy have had airway reconstruction using a molded silicone rubber prosthesis. In 8 patients the distal trachea and carina

were replaced with a bifurcated graft. One individual with multiple preoperative lung abscesses could never be weaned from the respirator and died in three weeks. Two other patients with malignancy who were completely relieved of their respiratory obstruction died 15 and 18 months following operation from disseminated cancer. The remainder are living from 1 to 4½ years.

Eighteen individuals have had the trachea reconstructed with a straight graft of silicone rubber. In 5 patients with long strictures the prosthesis was inyaginated into the upper and lower ends of the trachea and fixed into position with a few sutures. In 13 individuals a primary anastomosis of the cut ends of the trachea was performed. In this group there was one early death from erosion of the innominate artery and 5 late deaths from a variety of conditions, but unrelated to the prosthesis.

Although all the individuals have been able to effectively remove their secretions, in some of the patients there has been a propensity for granulomas to form at the distal suture line. This has been managed with intermittent bronchoscopy and fulguration. Despite the placement of a foreign body in an infected area, there have been no prosthetic disruption. From our observation this would seem to be a reasonable approach to the problem of extensive airway reconstruction.

\*By invitation

## SATURDAY MORNING, APRIL 24, 1976

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SATURDAY MORNING, APRIL 24,  
1976

8:30 A.M. Scientific Session

[Los Angeles Ballroom](#)

### 13. Pulmonary Neoplasm with Solitary

**Cerebral Metastasis: Results of**

**Combined Excision**

DONALD J. MAGILLIGAN, JR.\* , J. SPEED ROGERS\* ,

ROBERT S. KNIGHTON\* and JULIO C. DAVILA, Detroit,  
Michigan

At Henry Ford Hospital, since 1960, twenty patients have undergone lung resection for pulmonary malignancy and attempt at gross total removal of a solitary cerebral metastasis. Neurologic symptoms led

to the discovery of lung cancer in 5 patients. In the other 15, neurologic symptoms appeared from 2-10 months (Avg. 5.3 mos) following pulmonary resection. The predominant presenting neurologic symptoms were: headache 6, hemiparesis 9, hemiplegia 2, seizures 1, visual disturbance 1, and ataxia 1. Brain scanning, pneumoencephalography and particularly arteriography were used for localization and to determine singularity. Of the twenty patients, 7 had good results. Six of these seven are alive more than one year after removal of the metastasis with minimal or no neurologic symptoms. One patient died three years after craniotomy due to bronchoesophageal fistula from recurrence of his pulmonary cancer. He had no neurologic symptoms. Four of twenty patients had a fair result with survival from 9 to 20 months but with significant relief of their neurological symptoms. The result in nine patients was classified as poor - with either no significant neurologic improvement or survival less than six months. Included in this group is the one operative death. Of the group with good results all were operated on after 1968 whereas in the fair and poor groups only 3 or 13 were operated during this period. The improved results with the more recent experience is due to earlier and more accurate diagnosis and encourages us to pursue an aggressive surgical approach to the pulmonary neoplasm with solitary cerebral metastasis.

\*By invitation

#### **14. Gallium 67 Scanning for Carcinoma of the Lung**

T. R. DeMEESTER\*, C. BEKERMAN\*, J. G. JOSEPH\*,

M. S. TOSCANO\*, N. J. GROSS\* and D. B. SKINNER,  
Chicago, Illinois

Gallium 67 citrate is the best radiopharmaceutical currently available for localizing tumors. We have prospectively evaluated its use in 47 patients with pulmonic lesions suspected to be primary carcinoma and in whom subsequent histological diagnosis was obtained. 34/37 patients with histologically proven carcinoma of the lung had a positive gallium scan giving a tumor sensitivity of 92%. 8/9 patients with benign lesion had a negative gallium scan giving a tumor specificity of 89%. These results give a statistical validity of usefulness for the gallium scan in diagnosing carcinoma of  $p < .001$ . Squamous cell lesions had the highest sensitivity (94%). Adenocarcinoma was the least sensitive. The gallium scan was equally useful in the evaluation of peripheral and central lesions. There was no difference among T1, T2 and T3 lesions in their ability to take up gallium.

Twenty-eight patients with proven carcinoma of the lung had their mediastinum evaluated by gallium

scanning and compared to lymph node biopsies obtained on mediastinoscopy. Of 14 patients with proven lymph node metastasis, 8 showed evidence of lymph node involvement on gallium scan. Of 12 patients with normal mediastinal nodes, 10 were normal on gallium scan. This gave a sensitivity for determining positive mediastinal lymph nodes of 57% and specificity of 83%.

It is concluded that gallium 67 citrate has a high sensitivity and specificity for uptake in malignant lung lesions of various sizes and is therefore helpful in the diagnosis of malignancy. It appears particularly valuable in assessing peripheral solitary nodules. Gallium scan is less useful than mediastinoscopy in assessing mediastinal lymph node metastasis, however, a positive scan can be used to identify metastatic lymph nodes for biopsy during mediastinoscopy.

\*By invitation

## **15. Immune Reactivity in Primary Carcinoma of Lung and Its Relation to Prognosis**

HAROLD J. WANEBO\*, NYOTO MIYAZAWA\*, BHASKAR RAO\*,

NAEL MARTINI, and EDWARD J. BEATTIE, JR., New York, New York

Studies of immune reactivity were performed in 151 patients who underwent thoracotomy from 1971 to 1974. 131 patients had primary lung cancer and 20 patients had benign lesions. Skin tests with DNCB and intradermal antigens were performed in all patients and in vitro immune parameters (lymphocyte stimulation with mitogens and common antigens and enumeration of T and B cell levels) were performed in one-half of these patients. The DNCB skin test was positive in 73% of the patients with lung cancer and all (100%) of the patients with benign disease ( $P < .05$ ). DNCB reactivity was related to the clinical stage of disease. The incidence of positive DNCB reactions was 78% for Stage I & II cancers (37 patients), 73% for resectable Stage III cancer (22 patients), and 66% in patients with unresectable or inoperable Stage III cancer (72 patients). There were also differences according to the histology of primary cancer. The incidence of DNCB+ responses was 80% in patients with epidermoid cancer (46), 57% in patients with adenocarcinoma (46), 64% in patients with oat cell carcinoma, and 80% in patients with terminal bronchiolar carcinoma (10) and 84% in 17 patients with miscellaneous histologic diagnoses. In vitro immune studies showed better correlation with clinical stage, than observed with skin tests. Of these

studies measurement of lymphocyte stimulation with mitogens and common antigens showed a better correlation with clinical stage than T or B cell counts per se.

There was a correlation of disease free survival with DNCB reactivity in patients with Stage III cancer who had a minimum of one year followup. Of 37 patients who were DNCB+, 10 (37%) were free of disease at one year compared to 2 of 19 patients (11%) who were DNCB- ( $P < .01$ ). The details and clinical significance of these studies will be discussed.

\*By invitation

## **16. Regional Immunotherapy with Intrapleural BCG for Lung Cancer: Surgical Considerations**

MARTIN F. MCKNEALLY\*, HARVEY W. KAUSEL and  
RALPH D. ALLEY, Albany, New York

Stimulation of the regional lymph nodes with intrapleural BCG reduces the growth of experimental lung tumors in mice (Civerchia, Dhar, Maver and McKneally, Fed. Proc. 34:1036, 1975). Used in combination with isoniazid in the immediate post-resection interval, it appears to prolong disease-free survival in patients with lung cancer when contrasted with a simultaneous randomized control group. In 17 patients with Stage I lung cancer treated with post-operative BCG, there were no recurrences and no deaths. In 22 patients with Stage I disease in the control group, there were 9 recurrences and 5 deaths (Median duration of follow-up for both groups = 12 months.  $P = 0.016$ ). In Stage II and Stage III disease, the effect is less clear. There were 6 recurrences in 12 such patients treated with BCG and 7 recurrences in 9 control patients (Median duration of follow-up for both groups = 6 months.  $P = n.s.$ ).

The vaccine is administered by injection through the chest tube in patients undergoing subtotal pulmonary resection. After pneumonectomy, it is administered by thoracentesis. Use of this route raises certain technical and judgmental problems for the operating surgeon,

1. An immediate influenza-like syndrome of fever, chills and malaise follows intrapleural injection of BCG. Patients should not be treated until they are hemodynamically stable.

2. Delivery of the vaccine to the regional lymph nodes requires its administration into the free pleural space. Sinus tract formation by prolonged catheter drainage for air leak frustrates this purpose. Care should -be taken to seal off parenchymal air leaks at

the time of surgery by the use of pleural flaps and tents, and suture ligation of minor air leaks.

3. Suppurating lymphadenitis and severe ulceration of injection sites has been reported in anergic patients given intrapleural BCG for cutaneous melanoma. The preoperative immunologic status of the patients should be evaluated by a routine panel of skin tests to recall antigens, and completely anergic lung cancer patients should be excluded. Following these guidelines, we have experienced no major complications of intrapleural BCG immunostimulation in 40 patients undergoing pulmonary resection for malignant disease.

#### **INTERMISSION - VISIT EXHIBITS**

\*By invitation

### **17. Surgical Treatment of Clamping Injury of the Ascending Aorta**

BRITT LITCHFORD\*, J. EDWARD OKIES\*, SHUICHIRO SUGIMURA\*

and ALBERT STARR, Portland, Oregon

Clamp injury of the ascending aorta with intimal tear and dissection is a rare and dangerous complication of aortic cross-clamping infrequently mentioned in the literature. Since the clamp is generally applied near the distal aortic cannulation site, recannulation in the femoral (or iliac) artery or in the transverse arch of the aorta must be accomplished to allow reapplication of the cross-clamp at the base of the innominate artery. The ascending aorta should then be opened transversely over the tear and repaired directly with Teflon felt bolsters.

Successful treatment of this complication in two recent patients and review of three earlier cases underscores the importance of the direct approach to aortic dissection resulting from clamp injury. Three patients in whom the dissection was dealt with directly survived the operation, but one patient died 24 days post-operatively secondary to complications of the paraplegia that occurred at the time of the dissection (pulmonary infection and sepsis). Two patients who had indirect management of their dissection died of extension of the dissection with massive hemorrhage, one on the operating table and the other three weeks post-operatively.

Immediate recognition of this complication in combination with an aggressive direct approach can result in survival in an otherwise lethal condition.

\*By invitation

## **18. Infectious Complications Following Median Sternotomy and Cardiopulmonary Bypass**

ALFRED T. OULLIFORD\*, ROBERT H. ZEFF\*, O. WAYNE ISOM\*,

JOSEPH N. CUNNINGHAM\*, PHYLLIS TEIKO\*, and

FRANK C. SPENCER, New York, New York

Between Jan. 1, 1971 and Dec. 31, 1974, 2,465 patients underwent median Sternotomy and Cardiopulmonary bypass to correct a variety of congenital and acquired cardiac lesions. Thirty-nine patients (1.5%) developed wound infections which required operative intervention for control.

Twenty-nine patients had their infections recognized and treated within 30 days of cardiac surgery. Perfusion time in excess of three hours, excessive postoperative bleeding, re-exploration for bleeding, prolonged pharmacologic support for low-output states, external cardiac massage, tracheostomy, presence of diabetes, resternotomy and emergency operation were factors associated with a high rate of wound infection.

Following debridement, closed antibiotic irrigation was instituted in 27 patients and open drainage in two. Of those treated with the closed antibiotic irrigating technique, 88% were discharged from hospital with healed wounds within three weeks of diagnosis. Mortality in this group of patients was 14% (4 patients).

A second group of 10 patients had their infections recognized and treated after 30 days of original cardiac surgery. Infections in this group were more indolent than in the first. Eight had sternal dehiscence and two had chondritis.

Four patients required open drainage; in four, sternal closure and closed antibiotic irrigation could be achieved. The mortality in this group was 20% with an average hospital stay of 75 days. Six patients required more than one procedure for the control of persistent chondritis.

In patients undergoing coronary artery bypass grafting with only saphenous veins, an infection rate of 1.3% was noted. When a single internal mammary artery was used, the infection rate rose to 1.8%, when both were used it was 8.8%. Factors believed to be responsible for this increase are discussed.

The data emphasize the importance of early diagnosis, which permits effective treatment with closed antibiotic irrigation in the majority of cases.

### **11:15 Address of Honored Speaker**

#### **THE DOCTOR'S DILEMMA**

**Eoin O'Malley, M.Ch., F.R.C.S.I.**

**Professor of Surgery**

**University College  
Dublin, Ireland**

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## **SATURDAY AFTERNOON, APRIL 24, 1976**

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**SATURDAY AFTERNOON, APRIL 24,  
1976**

**2:00 P.M. Scientific Session**

**Los Angeles Ballroom**

### **19. Traumatic Aortic Rupture: A Five Year Experience**

STEPHEN Z. TURNEY, SAFUH ATTAR, ROBERT  
AYELLA\*,

R. ADAMS COWLEY and JOSEPH McLAUGHLIN,  
Baltimore, Maryland

In the five year period ending October 1975, 31 consecutive patients with traumatic rupture of the thoracic aorta underwent surgery at the University of Maryland Hospital or the Maryland Institute for Emergency Medicine. All cases were confirmed by preoperative aortogram. Rupture was confined to one or more sites in the descending thoracic aorta at or distal to the origin of the left subclavian artery. The age range was 15 to 67 years with a mean of 26 years. Operation was done within an average of 18 hours of injury. Significant non-thoracic injuries were present in every case. Six patients with positive peritoneal lavage underwent exploratory laparotomy prior to thoracotomy because of shock.

Surgical repair was done using left heart bypass in 2 cases (1 death), a passive aorto-aorto shunt in 23 cases (5 deaths) and without shunt or bypass in 6 cases (no deaths). An end-to-end tubular dacron graft was used to reconstruct the aorta in all but one patient.

Overall survival rate was 25 of 31 patients (81%). Paraplegia developed in one patient in the aorto-aorto shunt group. Renal failure developed in three patients (2 deaths, v.i.), all in the aorto-aorto shunt group and all with a prolonged period of preoperative hypotension. Hypertension was present preoperatively and lingered for several days postoperatively in 18 (72%) of the survivors. Left recurrent laryngeal nerve palsy persisted in 8 (32%) of the survivors. Two of the deaths were related to

technical problems of the shunting procedure and two to intra-pleural exsanguination before proximal aortic control could be achieved. Two other deaths occurred 3 days postoperatively from associated cerebral trauma and renal failure.

This series lends support to the rigorous aortographic search for ruptured thoracic aortas in trauma patients with widened mediastinum since good overall survival can be achieved even in the face of multiple trauma. Once experience has been gained using shunting techniques, repair of descending thoracic aortic tears may be safely carried out without shunt if done expeditiously.

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## **20. The Contribution of Anticoagulants to Platelet Dysfunction with Extracorporeal Circulation**

HERBERT W. WALLACE, HELENE BROOKS\*, THOMAS P. STEIN\*

and NANCY J. ZIMMERMAN\*, Philadelphia, Pennsylvania

The problem of platelet dysfunction and loss during and following extra-corporeal circulation remains an enigma. The results of this investigation which evaluates the effects of anticoagulants on platelet function causes concern about those studies of platelet function performed directly on patients undergoing extracorporeal circulation. Fresh human blood from 40 non-medicated volunteers was anticoagulated with 4.3 units/ml heparin and/or ACD (1:9). Retention of platelets from whole blood on glass beads was performed by the method of Bowie. Platelet retention of heparinized blood, as expected, averaged  $88.1 \pm SE 1.5\%$ . However, ACD platelets averaged only  $24.6 \pm SE 2.8\%$ . Platelet retention with CPD and EDTA yielded similar low values ( $26.0 \pm 3.9\%$  and  $19.1 \pm 7.5\%$  respectively). The addition of ACD to heparinized blood also decreased platelet retention ( $19.7 \pm 3.1\%$ ). The addition of heparin to ACD or CPD blood did not alter the original decreased retention. Calcium added (even in excess) to blood containing heparin and ACD did not reverse the depressed retention ( $29.3 \pm 4.6\%$ ). The substitution of CPD gave similar results. Utilizing mixtures of separately collected ACD blood and heparinized blood, depression of platelet retention was directly proportional to the amount of ACD blood present. Altering the pH of the ACD blood did not affect its depressed retention of platelets. Neutralizing heparinized blood 50% with protamine or polybrene also significantly depressed platelet retention ( $51 \pm 1.3\%$  and  $35.5 \pm 4\%$ ). Neither protamine nor polybrene

had any effect upon ACD blood. These data indicate that anticoagulants may play a significant role in the depressed platelet function observed during and following extracorporeal circulation. The presence of adequate numbers of platelets in the circulation does not assure that their function is physiologically normal. Platelets exposed to anticoagulants and other agents during ECC do not provide the ideal model for the study of platelet dysfunction.

\*By invitation

## **21. Effects of Pulsatile and Nonpulsatile Coronary Perfusion on Canine Left Ventricular Performance**

SALEM M. HABAL\*, MELVIN B. WEISS\*, HENRY M. SPOTNITZ\*,

EDUARDO N. PARODI\*, MARIANNE WOLFF\*, PAUL J. CANNON\*,

BRIAN F. HOFFMAN\* and JAMES R. MALM, New York, New York

The effects of pulsatile (P) versus nonpulsatile (NP) coronary perfusion (CP) on myocardial protection were studied during normothermic cardiopulmonary bypass. NP perfusion was done in 7 dogs with beating hearts (BH), Group A, and in 7 during spontaneous ventricular fibrillation (Fib), Group B. P perfusion was done in 8 other animals with Fib, Group C. Two additional dogs in each group were used for histological studies. For 120 minutes CP was regulated at a mean pressure of 100 mmHg for NP and 80 mmHg for P (110/40 phasic). Before and after CP a 25 ml intraventricular balloon was used to measure isovolumic pressure, peak dp/dt and compliance ( $\Delta V/\Delta P$ ). Regional myocardial blood flow (MBF) was measured using 8-10 $\mu$  radioactive microspheres. Total coronary blood flow, myocardial oxygen consumption ( $MVO_2$ ) and lactate extraction were measured at 30 minute intervals.

Results were compared by analysis of variance. After 120 minutes of CP, Group B (NP/Fib) when compared to Group A (NP/BH) showed no significant change in peak dp/dt, a 50% decrease in compliance (3.3 to 1.6 ml/mmHg,  $p < 0.01$ ), a greater  $MVO_2$  ( $3.6 \pm 2.8$  vs  $0.83 \pm .64$  ml/min/100g,  $p < 0.05$ ) and a decrease in lactate extraction ( $1.9 \pm 2.8$  vs  $5.2 \pm 3.3\%$ ,  $p < 0.05$ ). Total L.V. MBF was not different in the two groups, but the endocardial/epicardial flow ratio was lower in Group B ( $1.06 \pm .16$  vs  $1.37 \pm .37$  ml/min/g,  $p < 0.05$ ). Histological study of Group B demonstrates subendocardial ischemic changes and focal hemorrhage, whereas Group A showed midmyocardial linear condensation of sarcoplasm.

In Group C (P/Fib) after 120 minutes, peak dp/dt actually increased ( $2274 \pm 889$  to  $3086 \pm 1023$  mmHg/sec at 25ml,  $p < 0.01$ ) where as compliance remained unchanged with time (2.6 to 2.4ml/mmHg). Although total L. V. MBF was reduced ( $1.03 \pm .23$  ml/min/g,  $p < 0.01$ ),  $MVO_2$  was not significantly different from Group B, because of a 70% increase in oxygen extraction,  $p < 0.05$ . Lactate extraction was also increased ( $9.28 \pm 3.7\%$ ,  $p < 0.01$ ) above Group B and the LV endocardial/epicardial flow ratio was greater in Group C ( $1.21 \pm .23$ ,  $p < 0.05$ ). Histological study demonstrated limited patchy midmyocardial condensation of sarcoplasm but no evidence of subendocardial ischemia.

The results demonstrate the superiority of pulsatile CP in preserving ventricular performance during prolonged ventricular fibrillation. The increased  $MVO_2$  of ventricular fibrillation is associated, during pulsatile CP, with increased myocardial O<sub>2</sub> extraction and lower total MBF preventing subendocardial ischemia and hemorrhage.

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## **22. Clinical and Hemodynamic Criteria for Use of Intra-Aortic Balloon Pump (IABP) in Cardiac Surgery Patients**

HOOSHANG BOLOOKI, RICHARD J. THURER\*,  
ABELARDO VARGAS\*,

WILLIS H. WILLIAMS\*, GERARD A. KAISER, FRANK  
MACK\*,

ALI GHAHRAMANI\* and ADRIANE FRIED\*, Miami,  
Florida

Application of IABP for heart failure in cardiac surgical patients (pts) has been the subject of recent controversy. In order to establish criteria for use of this modality a retrospective study of 42 pts who required IABP because of inability to be weaned from cardiopulmonary bypass was done. Patients in cardiogenic shock pre-operatively were excluded. The 42 pts included 23 (Group A) who had severe preoperative (preop) left ventricular (LV) dysfunction with cardiac index (CI)  $< 1.8$  L min/m<sup>2</sup>, ejection fraction (EF)  $< 30\%$ , end-diastolic pressure (EdP)  $> 25$ mmHg and 19 (Group B) who had a combination of moderate cardiac dysfunction (CI  $< 2.2$ , EF  $< 40$ , EdP  $> 18$ ) in the presence of severe LV hypertrophy, acute infarction, severe aortic stenosis (gradient  $> 85$ mmHg) with or without coronary disease. There was an inverse relation between survival and delay from completion of operation to the use of IABP. 32 of 42 pts were weaned off bypass and were balloon assisted for 24-96 hours postop; 22 pts were discharged (52%). In Group A 14 of 23 (60%) and in Group B 8 of 19 (36%)

survived. Based on these findings during '74-'75, 22 pts were operated with elective use of IABP along with serial hemodynamic studies. 12 had preoperative severe LV dysfunction similar to Group A and 10 had moderate dysfunction in combination with pathology similar to Group B. Fifteen of these pts were hemodynamically unstable at the time of arrival to operating room and received IABP under local anesthesia. Twenty pts (90%) received IABP for 12-36 hours postop and were hospital survivors. In Group A (12 of 12) and in Group B 8 of 10 were among survivors. Criteria for use of IABP in cardiac surgery should include severe preop LV dysfunction and the combination of moderate dysfunction with LV hypertrophy, coronary and valvular pathology.

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change in peak dp/dt, a 50% decrease in compliance (3.3 to 1.6 ml/mmHg,  $p < 0.01$ ), a greater  $MVO_2$  ( $3.6 \pm 2.8$  vs  $0.83 \pm .64$  ml/min/100g,  $p < 0.05$ ) and a decrease in lactate extraction ( $1.9 \pm 2.8$  vs  $5.2 \pm 3.3\%$ ,  $p < 0.05$ ). Total L.V. MBF was not different in the two groups, but the endocardial/epicardial flow ratio was lower in Group B ( $1.06 \pm .16$  vs  $1.37 \pm .37$  ml/min/g,  $p < 0.05$ ). Histological study of Group B demonstrates subendocardial ischemic changes and focal hemorrhage, whereas Group A showed midmyocardial linear condensation of sarcooplasm.

In Group C (P/Fib) after 120 minutes, peak dp/dt actually increased ( $2274 \pm 889$  to  $3086 \pm 1023$  mmHg/sec at 25ml,  $p < 0.01$ ) where as compliance remained unchanged with time (2.6 to 2.4ml/mmHg). Although total L. V. MBF was reduced ( $1.03 \pm .23$  ml/min/g,  $p < 0.01$ ),  $MVO_2$  was not significantly different from Group B, because of a 70% increase in oxygen extraction,  $p < 0.05$ . Lactate extraction was also increased ( $9.28 \pm 3.7\%$ ,  $p < 0.01$ ) above Group B and the LV endocardial/epicardial flow ratio was greater in Group C ( $1.21 \pm .23$ ,  $p < 0.05$ ). Histological study demonstrated limited patchy midmyocardial condensation of sarcooplasm but no evidence of subendocardial ischemia.

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with cardiac index (CI) < 1.8 L min/m<sup>2</sup>, ejection fraction (EF) < 30%, end-diastolic pressure (EdP) > 25mmHg and 19 (Group B) who had a combination of moderate cardiac dysfunction (CI < 2.2, EF < 40, EdP > 18) in the presence of severe LV hypertrophy, acute infarction, severe aortic stenosis (gradient > 85mmHg) with or without coronary disease. There was an inverse relation between survival and delay from completion of operation to the use of IABP. 32 of 42 pts were weaned off bypass and were balloon assisted for 24-96 hours postop; 22 pts were discharged (52%). In Group A 14 of 23 (60%) and in Group B 8 of 19 (36%) survived. Based on these findings during '74-'75, 22 pts were operated with elective use of IABP along with serial hemodynamic studies. 12 had preoperative severe LV dysfunction similar to Group A and 10 had moderate dysfunction in combination with pathology similar to Group B. Fifteen of these pts were hemodynamically unstable at the time of arrival to operating room and received IABP under local anesthesia. Twenty pts (90%) received IABP for 12-36 hours postop and were hospital survivors. In Group A (12 of 12) and in Group B 8 of 10 were among survivors. Criteria for use of IABP in cardiac surgery should include severe preop LV dysfunction and the combination of moderate dysfunction with LV hypertrophy, coronary and valvular pathology.

**3:30 P.M. Executive Session (Limited to Active and Senior Members)**

**Los Angeles Ballroom**

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**7:00 P.M. President's Reception**

**Beverly Hills Ballroom**

**8:00 P.M. President's Dinner and Dance**

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**SATURDAY AFTERNOON, APRIL 24,  
1976**

**2:00 P.M. Scientific Session**

**Los Angeles Ballroom**

**19. Traumatic Aortic Rupture: A Five Year  
Experience**

STEPHEN Z. TURNEY, SAFUH ATTAR, ROBERT  
AYELLA\*,

R. ADAMS COWLEY and JOSEPH McLAUGHLIN,  
Baltimore, Maryland

In the five year period ending October 1975, 31 consecutive patients with traumatic rupture of the thoracic aorta underwent surgery at the University of Maryland Hospital or the Maryland Institute for Emergency Medicine. All cases were confirmed by preoperative aortogram. Rupture was confined to one or more sites in the descending thoracic aorta at or distal to the origin of the left subclavian artery. The age range was 15 to 67 years with a mean of 26 years. Operation was done within an average of 18 hours of injury. Significant non-thoracic injuries were present in every case. Six patients with positive peritoneal lavage underwent exploratory laparotomy prior to thoracotomy because of shock.

Surgical repair was done using left heart bypass in 2 cases (1 death), a passive aorto-aorto shunt in 23 cases (5 deaths) and without shunt or bypass in 6 cases (no deaths). An end-to-end tubular dacron graft was used to reconstruct the aorta in all but one patient.

Overall survival rate was 25 of 31 patients (81%). Paraplegia developed in one patient in the aorto-aorto shunt group. Renal failure developed in three patients (2 deaths, v.i.), all in the aorto-aorto shunt group and all with a prolonged period of preoperative hypotension. Hypertension was present preoperatively and lingered for several days postoperatively in 18 (72%) of the survivors. Left recurrent laryngeal nerve palsy persisted in 8 (32%) of the survivors. Two of the deaths were related to technical problems of the shunting procedure and two to intra-pleural exsanguination before proximal aortic control could be achieved. Two other deaths occurred 3 days postoperatively from associated cerebral trauma and renal failure.

This series lends support to the rigorous aortographic search for ruptured thoracic aortas in trauma patients with widened mediastinum since good overall survival can be achieved even in the face of multiple trauma. Once experience has been gained using shunting techniques, repair of descending thoracic aortic tears may be safely carried out without shunt if done expeditiously.

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HERBERT W. WALLACE, HELENE BROOKS\*, THOMAS P. STEIN\*

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The problem of platelet dysfunction and loss during and following extra-corporeal circulation remains an enigma. The results of this investigation which evaluates the effects of anticoagulants on platelet function causes concern about those studies of platelet function performed directly on patients undergoing extracorporeal circulation. Fresh human blood from 40 non-medicated volunteers was anticoagulated with 4.3 units/ml heparin and/or ACD (1:9). Retention of platelets from whole blood on glass beads was performed by the method of Bowie. Platelet retention of heparinized blood, as expected, averaged  $88.1 \pm SE 1.5\%$ . However, ACD platelets averaged only  $24.6 \pm SE 2.8\%$ . Platelet retention with CPD and EDTA yielded similar low values ( $26.0 \pm 3.9\%$  and  $19.1 \pm 7.5\%$  respectively). The addition of ACD to heparinized blood also decreased platelet retention ( $19.7 \pm 3.1\%$ ). The addition of heparin to ACD or CPD blood did not alter the original decreased retention. Calcium added (even in excess) to blood containing heparin and ACD did not reverse the depressed retention ( $29.3 \pm 4.6\%$ ). The substitution of CPD gave similar results. Utilizing mixtures of separately collected ACD blood and heparinized blood, depression of platelet retention was directly proportional to the amount of ACD blood present. Altering the pH of the ACD blood did not affect its depressed retention of platelets. Neutralizing heparinized blood 50% with protamine or polybrene also significantly depressed platelet retention ( $51 \pm 1.3\%$  and  $35.5 \pm 4\%$ ). Neither protamine nor polybrene had any effect upon ACD blood. These data indicate that anticoagulants may play a significant role in the depressed platelet function observed during and following extracorporeal circulation. The presence of adequate numbers of platelets in the circulation does not assure that their function is physiologically normal. Platelets exposed to anticoagulants and other agents during ECC do not provide the ideal model for the study of platelet dysfunction.

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## **BYLAWS**

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**CONSTITUTION OF  
THE AMERICAN ASSOCIATION  
FOR THORACIC SURGERY  
*As amended to April 15, 1975***

**ARTICLE I. Name**

Section 1. This Association shall be known as The American Association for Thoracic Surgery.

**ARTICLE II. Object**

Section 1. The object of the Association shall be to encourage and stimulate investigation and study that will increase the knowledge of intrathoracic physiology, pathology, and therapy, to correlate such knowledge and disseminate it.

Section 2. To attain this object, the Association shall hold at least one scientific meeting every year in which free discussion shall be featured; shall conduct a Journal for the publication of the papers presented at this meeting, and other acceptable articles; and shall undertake such other activities as the Council or the Association as a whole may decide.

**ARTICLE III. Membership**

Section 1. There shall be four classes of members: Honorary, Senior, Active and, for a time, Associate. Admission to membership in the Association shall be by election. Membership shall be limited, the limits on the respective classes to be determined by the By-laws. Only Active and Senior Members shall have the privilege of voting or holding office, except as provided by the By-laws.

Section 2. Election to Honorary, Senior or Active Membership shall be for life, subject to the provisions of Section 3 following. Starting with the 1970 annual meeting, there shall be no further additions to the Associate Membership. All new members shall be elected directly to Honorary or Active status. Associate Membership shall be continued for a limited period of time as determined by the By-laws.

Section 3. Membership may be voluntarily terminated at any time by members in good standing. The Council, acting as a Board of Censors, may recommend the expulsion of a member on the grounds of moral or professional delinquency, and submit his name, together with the grounds of complaint, to the Association as a whole at any of the regularly convened meetings, after giving the member so accused ample opportunity to appear in his own behalf.

**ARTICLE IV. Officers and Government**

Section 1. The officers of the Association shall be a President, a Vice-President, a Secretary, a Treasurer, and Editor, and five Councilors. These ten officers and councilors shall be the governing body of the Association, and shall have full power to act on all matters, except as follows:

1. They may not alter the initiation fees or annual dues, nor levy any general assessments against the membership, except that they may, in individual cases, remit annual dues or assessments.

2. They may in no wise change the Constitution or By-Laws.

3. They may neither elect new members nor alter the status of existing members, other than to apply the provisions of Article III, Section 3.

4. They may not deplete the principal of the Endowment Fund.

Section 2. Officers and Councilors shall be elected at the annual meeting of the Association, and shall take office upon conclusion of the meeting. The President and the Vice-President shall be elected for 3 one-year term of office and neither may here-elected to succeed himself in the same office. The Secretary, and Treasurer, and the Editor shall be elected for a one-year term of office, and any or all may be re-elected indefinitely. The outgoing President shall

automatically become a Councilor for a one-year term of office. The other four Councilors shall be elected, one each year, for a four-year term of office, but no Councilor may be re-elected to succeed himself.

Section 3. Vacancies occurring among the officers and councilors during the year shall be temporarily filled by action of the Council, subject to approval of the Association at the next regularly convened meeting.

#### ARTICLE V. Committees

Section 1. At the opening session of the annual meeting there shall be elected, after nomination from the floor of the Association, a Nominating Committee of three. This Committee shall prepare a slate of nominees for officers and councilors and shall present their report at the Executive Session of the Association.

Section 2. The Council is empowered to appoint a Membership Committee, an Auditing Committee, a Program Committee, a Necrology Committee, and such other committees as may in its opinion be necessary. All such committees shall render their report at the Executive Session of the Association.

Section 3. The Editor is empowered to appoint an Editorial Board, subject only to the approval of the Council.

Section 4. The Association as a whole may authorize the Council to appoint Scientific or Research Committees for the purpose of investigating thoracic problems and may further authorize the Council to support financially such committees to a limited degree. In appointing such committees, the Council shall be governed by the provisions of the By-Laws.

#### ARTICLE VI. Finances

Section 1. The fiscal year of the Association shall coincide with a calendar year. The books of the Association shall be kept and audited on this basis.

Section 2. Members shall contribute to the financial maintenance of the Association through the medium of initiation fees, annual dues, and special assessments. The amount of the annual dues and the initiation fees shall be determined" by the By-Laws.

If, at the end of any fiscal year, there be a deficit in the current funds of the Association, the Council may send out notices to that effect and invite Active members to contribute the necessary amount so that no deficit be carried over from one fiscal year to another. The Association may, in any regularly convened meeting, vote a special assessment for any purpose consistent with the objects of the Association (Article II), and such special assessment shall become an obligatory charge against the classes of members affected thereby.

Section 3. To meet the current expenses of the Association, there shall be available all revenue derived from annual dues, special assessments, and income from the Endowment Fund, subject to the provisions of Section 4, following. Funds derived from the payment of initiation fees shall not be available for current expenses.

Section 4. All funds derived from the payment of initiation fees shall be placed in a special fund, to be invested and reinvested in legal securities, to be held intact, and to be known as the Endowment Fund. The Council is responsible for the proper management of the Endowment Fund, and may divert any surplus in the current funds of the Association into this fund, but may not withdraw any of the principal of the Endowment Fund except in accordance with the provisions of Section 6, following.

Section 5. The income from the Endowment Fund shall be expended as the Council directs.

Section 6. The principal of the Endowment Fund may be withdrawn, in whole or in part, under the following conditions only: The amount of principal to be withdrawn shall have been approved by the Council; it shall have been approved by a majority of the members present and voting at a regularly convened annual meeting; it shall have been tabled for one year; it shall have been finally passed by a three-fourths vote of the members present and voting at the next regularly convened annual meeting.

Section 7. In the event of the dissolution of the Association, the Endowment Fund shall be distributed among national institutions of the United States and Canada in a proportion equal to the then existing ratio between the numbers of citizens of the two nations who are members of the Association.

#### ARTICLE VII. Meetings

Section 1. The time, place, duration, and procedure of the annual meeting of the Association shall be determined by the Council, and the provisions of the By-Laws.

Section 2. A special meeting of the Association may be called on one month's notice on the written request of fifteen members. The specific purposes of the meeting must be stated in the request and in the official call for the meeting.

Section 3. There shall be an annual meeting of the Council.

#### ARTICLE VIII. Amendments

Section 1. This Constitution shall in no wise be changed except by a three-fourths vote of the members present at an annual meeting, and further provided that the proposed alteration or amendment shall have been moved and seconded at a previous annual meeting, and that printed copies of the suggested alteration or amendment shall have been circulated among the members, and that the members shall have been specifically advised that such alteration or amendment will be voted upon.

### **BY-LAWS**

#### ARTICLE I.

Section 1. These By-Laws shall merely interpret the Constitution and specifically apply its principles. They shall set forth no principles not included in the Constitution.

#### ARTICLE II.

Section 1. All papers read before the Association shall become the property of the Association. Authors shall leave original copies of their manuscripts with the Editor or Reporter, at the time of presentation, for publication in the official journal.

Section 2. When the number of papers makes it desirable, the Council may require authors to present their papers in abstract, and may set a time limit on discussions.

Section 3. Members are urged to cooperate with all Scientific Committees of the Association.

Section 4. Attendance at Annual Meetings and participation in the scientific programs shall be optional for all Honorary and Senior Members, but it shall be expected from all Active and Associate Members.

Section 5. While the scientific session of the annual meeting is held primarily for the benefit of the members of the Association, it may be thrown open to nonmembers who are able to submit satisfactory credentials, who register in a specified manner, and who pay such registration fee as may be determined and published by the Council from year to year.

#### ARTICLE III.

Section 1. Candidates for membership in this Association must be formally nominated and seconded, in an approved manner, by not less than three Active or Senior Members. Such nomination must have been in the hands of the Membership Committee for not less than four months, and the name of the candidate must have been distributed to the Association as a whole before final action may be taken on any new candidate for election to Active Membership. Provided the foregoing requirements have been met and the candidates have been approved by the Membership Committee and by the Council, their names shall be presented to the Association at a regularly convened annual meeting for final action. A three-fourths vote of those present and voting shall be required to elect. Any candidate for membership in this Association who has failed of election for three successive years shall automatically cease to be a candidate and may not be renominated until after a lapse of three years.

Section 2. Active Membership shall be limited to six hundred. The candidate to be eligible must be a citizen of the United States of America or Canada, unless in unusual cases this citizenship requirement shall have been waived by Council. The candidate shall have achieved distinction in the thoracic field or shall have made a meritorious contribution to knowledge pertaining to thoracic disease or its surgical treatment.

Section 3. The Associate Members shall be appropriately phased out. The limited period of time for Associate Membership as required by Article HI, Section 2 of the Constitution, shall be five years. During this limited period, an Associate Member, if properly qualified, may be elected to Active Membership. After the expiration of this limited period an Associate Member, if not yet qualified for Active Membership, must either be re-elected to an additional period of Associate Membership or dropped from the rolls of the Association.

Section 4. The number of Senior Members shall be unlimited. Active Members automatically advance to Senior Membership at the age of sixty years. In addition, starting with the 1971 Annual Meeting, a younger Active Member may be eligible for Senior Membership if incapacitated by disability, but for no other reason.

Section 5. Honorary Membership shall be reserved for such distinguished persons as may be deemed worthy of this honor by the Council with concurrence of the Association.

Section 6. The report of the Membership Committee shall be rendered at the annual Executive Session of the Association. Candidates shall be presented in groups in the following order: Candidates for Honorary Membership; retirement of Active Members to Senior Membership; Candidates for Active Membership, Associate Members for reelection; members dropped from the rolls of the Association.

Section 7. The Council shall recommend that any Active or Associate Member whose dues are in arrears for two years, or who has been absent, without sufficient excuse, from three consecutive annual meetings, shall have his membership terminated.

Section 8. Notwithstanding Section 7, any member of the Association over 60 years of age is excused from the attendance requirement and upon his specific request may likewise be excused from the payment of dues.

#### ARTICLE IV.

Section 1. The President of the Association shall perform all duties customarily pertaining to the office of President. He shall not only preside at all meetings of the Association, but also at all meetings of the Council. The President shall be elected from the Active or Senior Members of the Association.

Section 2. The Vice-President of the Association shall perform all duties customarily pertaining to the office of the Vice-President, not only as to the Association, but also as to the Council. The Vice-President shall be elected from the Active or Senior Members of the Association.

Section 3. The Secretary of the Association shall perform all duties customarily pertaining to the office of Secretary. He shall serve not only as Secretary of the Association but also as Secretary of the Council. The Secretary shall be elected from the Active or Senior Members of the Association. When deemed appropriate, an Active or Senior Member may be elected to serve as an understudy to the Secretary in anticipation of the latter's retirement from office.

Section 4. The Treasurer of the Association shall perform all duties pertaining to the office of Treasurer. He shall not only serve as Treasurer of the Association but shall also serve as custodian of the Endowment Fund. The Treasurer shall be elected from the Active or Senior Members of the Association.

Section 5. The Editor of the Association shall be the Editor of the official Journal and shall, ex officio, be the Chairman of the Editorial Board. The Editor may be elected from the Honorary, Active, or Senior Members of the Association.

Section 6. The Councilors of the Association shall hold office as specified in the Constitution. They shall be elected from the Active or Senior Members of the Association.

Section 7. In the event of a vacancy occurring in the office of President, the Council shall advance the Vice-President to the Presidency and appoint a new Vice-President under the Provisions of Article IV, Section 3, of the Constitution.

#### ARTICLE V.

Section 1. The Nominating Committee shall consist of three Active or Senior Members who are, by preference, also past Presidents of the Association and in attendance at the meeting. They shall be elected in accordance with the provisions of Article V, Section 1, of the Constitution. The Council shall instruct the Committee as to the vacancies which are to be filled by election.

Section 2. The Membership Committee shall consist of seven Active or Senior Members appointed in accordance with the provisions of Article V, Section 2, of the Constitution. The Council may appoint not more than one of its own members to serve on this Committee. The duties of the Membership Committee are to investigate all candidates for membership in the Association and to report their findings as expeditiously as possible to the Council through the Secretary of the Association. This Committee is also charged with searching the literature of this and other countries to the end that proper candidates may be presented to the Association for consideration. Appointment to this Committee shall be for a period of one year, and not more than five of the members may be reappointed to succeed themselves. This Committee is also charged with maintaining a record of membership attendance and participation in the scientific programs and reporting to the affected members and to the Council any deviations from the requirement of Article II, Section 4, of these By-Laws.

Section 3. The Auditing Committee shall consist of three Active or Senior Members appointed in accordance with the provisions of Article V, Section 2, of the Constitution. None of these may be selected from the officers or councilors of the Association. Their duty shall be to audit the accounts of the Association each year and render their report to the

Executive Session of the Association. Appointment to this Committee shall be made for a one-year term. Not more than two members may be reappointed to succeed themselves.

Section 4. The Program Committee shall consist of five members: The President of the Association, the Secretary of the Association, the Editor of the Association, and two members at large, one of whom shall be resident at or near the place of annual meeting. The duties of this Committee shall be to arrange, in conformity with instructions from the Council, the scientific program for the annual meeting.

Section 5. The Necrology Committee shall consist of one or more Active or Senior Members, and shall be appointed in accordance with the provisions of Article V, Section 2, of the Constitution. Appointments to this Committee shall be for a one-year term of office. Any or all members of this Committee may be reappointed to succeed themselves. The Council may, if it so desires, appoint one of its own members to serve as Chairman of this Committee. The duties of the Necrology Committee shall be to prepare suitable resolutions and memorials upon the deaths of all members of the Association and to report such deaths at every annual meeting.

Section 6. The Editorial Board shall be appointed by the Editor, subject only to the approval of the Council. The Editor shall be, ex officio, the chairman of this board and shall be privileged to appoint and indefinitely reappoint such members of the Association, regardless of class of membership, and such non-members of the Association as in his opinion may be best calculated to meet the editorial requirements of the Association.

Section 7. When Scientific or Research Committees are authorized by the Association, the Council shall appoint the Chairmen of these Committees, with power to organize their committees in any way best calculated to accomplish the desired object, subject only to the approval of the Council. Financial aid rendered to such Committees shall not exceed such annual or special appropriations as may be specifically voted for such purposes by the Association as a whole.

Section 8. The Everts A. Graham Memorial Traveling Fellowship Committee shall consist of six members: The President, Secretary, and Treasurer of the Association and three members-at-large, one member being appointed by the President each year to serve a term of three years. The Chairman shall be the member-at-large serving his third year. The duties of the committee shall be to recommend Fellowship candidates to the Council, and to carry out all business pertaining to the Fellowship and the Fellows, past, present, and future.

Section 9. The Ethics Committee shall consist of five members appointed by the Council. No member shall serve more than four years. The Ethics Committee shall advise the Council concerning alleged breaches of ethics. Complaints regarding alleged breaches of ethics shall be received in writing by the Ethics Committee and shall be investigated by it. In addition, the Ethics Committee may investigate on its own initiative.

#### ARTICLE VI.

Section 1. Honorary Members of the Association are exempt from all initiation fees, dues, and assessments.

Section 2. Annual dues for Active Members shall be \$75.00.

Section 3. Annual dues for Associate Members shall be \$75.00.

Section 4. Senior Members are exempt from dues.

Section 5. Initiation fee for those elected directly to Active Membership shall be \$15.00.

Section 6. If and when an Associate Member is elected to Active Membership, he shall pay an additional \$5.00 initiation fee.

Section 7. Income from the Endowment Fund shall be expended as the Council directs.

Section 8. Associate and Active Members must subscribe to THE JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY to retain their membership status.

Section 9. Senior Members may retain their membership status without the payment of annual dues, and subscription to THE JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY is optional.

(NOTE. Bills for membership dues and for subscriptions to THE JOURNAL OF THORACIC AND CARDIOVASCULAR SURGERY will be mailed to members by the Treasurer after the annual meeting.)

#### ARTICLE VII.

Section 1. When the Association convenes for its annual meeting, it shall immediately go into executive session, but the business at this session shall be limited to:

1. Election of Nominating Committee.
2. Appointment of necessary committees.
3. Miscellaneous business of an urgent nature.

Section 2. The annual executive session of the Association shall be held at the opening of the afternoon session of the second day of the meeting. The order of business shall be:

1. Reading of the minutes of the preceding meetings of the Association and Council.
2. Report of the Treasurer for the last fiscal year.
3. Report of the Auditing Committee.
4. Report of the Treasurer for the current year to date.
5. Report of the Necrology Committee.
6. Report of the Program Committee.
7. Action on amendments to the Constitution and By-Laws.
8. Action of recommendations emanating from the Council.
9. Unfinished Business.
10. New Business.
11. Report of the Membership Committee..
12. Election of new members.
13. Report of the Nominating Committee.
14. Election of officers.

Section 3. There shall be an annual meeting of the Council.

#### ARTICLE VIII.

Section 1. These By-Laws shall in no wise be changed except by a two-thirds vote of the members present at the annual meeting or a properly convened meeting of the Association, and further provided that the proposed action or amendment shall have been moved and seconded by not less than three of the members in a properly convened annual or special meeting of the Association.

Section 2. These By-Laws may be suspended in whole or in part for a period of not more than twelve hours by a unanimous vote of those present at any regularly convened meeting of the Association.

## CHARTER MEMBERS

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### THE AMERICAN ASSOCIATION FOR THORACIC SURGERY

#### Charter Members

June 7, 1917

E. Wyllis Andrews	Arthur A. Law
John Auer	William Lerche
Edward R. Baldwin	Howard Lilienthal

Walter M. Boothby	William H. Lockett
William Branower	Morris Manges
Harlow Brooks	Walton Martin
Lawrason Brown	Rudolph Matas
Kenneth Bulkley	E. S. McSweeney
Alexis Carrel	Samuel J. Meltzer
Norman B. Carson	Willy Meyer (Founder)
J. Frank Corbett	James Alexander Miller
Armistead C. Crump	Robert T. Miller
Charles N. Dowd	Fred J. Murphy
Kennon Dunham	Leo S. Peterson
Edmond Melchior Eberts	Eugene H. Pool
Max Einhorn	Walther I. Rathbun
Herman Fischer	Martin Rehling
Albert H. Garvin	B. Merrill Ricketts
Nathan W. Green	Samuel Robinson
John R. Hartwell	Charles I. Scudder
George J. Heuer	William H. Stewart
Chevalier Jackson	Franz Torek
H. H. Janeway	Martin W. Ware
James H. Kenyon	Abraham O. Wilensky
Adrian V. S. Lambert	Sidney Yankauer

## ANNUAL MEETING DATES

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### Meetings of the American Association for Thoracic Surgery

1918-Chicago.....	President, Samuel J. Meltzer
1919-Atlantic City.....	President, Willy Meyer
1920-New Orleans.....	President, Willy Meyer
1921-Boston.....	President, Rudolph Matas
1922-Washington.....	President, Samuel Robinson
1923-Chicago.....	President, Howard Lilienthal
1924-Rochester, Minn.....	President, Carl A. Hedblom
1925-Washington.....	President, Nathan W. Green
1926-Montreal.....	President, Edward W. Archibald
1927-New York.....	President, Franz Torek
1928-Washington.....	President, Evarts A. Graham
1929-St. Louis.....	President, John L. Yates

1930-Philadelphia..... President, Wyman Whittemore  
 1931-San Francisco..... President, Ethan Flagg Butler  
 1932-Ann Arbor..... President, Frederick T. Lord  
 1933-Washington..... President, George P. Muller  
 1934-Boston..... President, George J. Heuer  
 1935-New York..... President, John Alexander  
 1936-Rochester, Minn..... President, Carl Eggers  
 1937-Saranac Lake..... President, Leo Eloesser  
 1938-Atlanta..... President, Stuart W. Harrington  
 1939-Los Angeles..... President, Harold Brunn  
 1940-Cleveland..... President, Adrian V. S. Lambert  
 1941-Toronto..... President, Fraser B. Gurd  
 1944-Chicago..... President, Frank S. Dolley  
 1946-Detroit..... President, Claude S. Beck  
 1947-St. Louis..... President, I. A. Bigger  
 1948-Quebec..... President, Alton Ochsner  
 1949-New Orleans..... President, Edward D. Churchill  
 1950-Denver..... President, Edward J. O'Brien  
 1951-Atlantic City..... President, Alfred Blalock  
 1952-Dallas..... President, Frank B. Berry  
 1953-San Francisco..... President, Robert M. Janes  
 1954-Montreal..... President, Emile Holman  
 1955-Atlantic City..... President, Edward S. Welles  
 1956-Miami Beach..... President, Richard H. Meade  
 1957-Chicago..... President, Cameron Haight  
 1958-Boston..... President, Brian Blades  
 1959-Los Angeles..... President, Michael E. De Bakey  
 1960-Miami Beach..... President, William E. Adams  
 1961-Philadelphia..... President, John H. Gibbon, Jr.  
 1962-St. Louis..... President, Richard H. Sweet (Deceased 1-11-62)  
 ..... President, O. Theron Clagett  
 1963-Houston..... President, Julian Johnson  
 1964-Montreal..... President, Robert E. Gross  
 1965-New Orleans..... President, John C. Jones  
 1966-Vancouver, B. C..... President, Herbert C. Maier  
 1967-New York..... President, Frederick G. Kergin  
 1968-Pittsburgh..... President, Paul C. Samson  
 1969-San Francisco..... President, Edward M. Kent  
 1970-Washington, D. C..... President, Hiram T. Langston  
 1971-Atlanta..... President, Thomas H. Burford  
 1974-Las Vegas..... President, Lyman A. Brewer, III  
 1975-New York..... President, Wilfred G. Bigelow  
 1976-Los Angeles..... President, David J. Dugan  
 1977-Toronto..... President, Henry T. Bahnson  
 1978-New Orleans..... President, J. Gordon Scannell  
 1979-Boston..... President, John W. Kirklin  
 1980-San Francisco..... President, Herbert Sloan  
 1981-Washington, D.C..... President, Donald L. Paulson  
 1982-Phoenix, Arizona..... President, Thomas B. Ferguson  
 1983-Atlanta..... President, Frank C. Spencer  
 1984-New York..... President, Dwight C. McGoon

## AWARDS

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**EVARTS A. GRAHAM  
MEMORIAL TRAVELING FELLOWS**

- 1st 1951- L. L. Whytehead, M.D., F.R.C.S.  
52 790 Sherbrooke St., Winnipeg 2,  
Manitoba, CANADA
- 2nd 1953- W. B. Ferguson, M.B. F.R.C.S.  
54 Royal Victoria Infirmary, Newcastle-  
upon-tyne, ENGLAND
- 3rd 1954- Lance L. Bromley, M.Chir., F.R.C.S.  
55 St. Mary's Hospital, London, W.2,  
ENGLAND
- 4th 1955- Raymond L. Hurt, F.R.C.S.  
56 The White House, 8 Loom Lane,  
Radlett Herts, ENGLAND
- 5th 1956- Mathias Paneth, F.R.C.S.  
57 Brompton Hospital, London, S.W. 3,  
ENGLAND
- 6th 1957- Peter L. Brunnen, F.R.C.S.  
58 Department of Thoracic Surgery,  
Woodend General Hospital  
Aberdeen, SCOTLAND
- 7th 1958- N. G. Meyne, M.D.  
59 University of Amsterdam,  
Wilhelmina-Gasthuis, Amsterdam,  
HOLLAND
- 8th 1960- Godrej S. Karai, M.D.  
61 Calcutta, INDIA
- 9th 1961- Fritz Helmer, M.D.  
62 Second Surgical Clinic, University of  
Vienna, Vienna, AUSTRIA
- 10th 1962- Theodor M. Scheinin, M.D.  
63 Oulun Laaninsairaala, Oulu,  
FINLAND
- 11th 1963- Masahiro Saigusa, M.D.  
64 Department of Surgery, Tokyo  
University School of Medicine  
1 Motofuji-cho, Bunkyo-Ku, Tokyo,  
JAPAN
- 12th 1963- Adar J. Hallen, M.D.  
64 Department of Thoracic Surgery,  
University Hospital  
Uppsala, SWEDEN
- 13th 1964- Stuart C. Lennox, M.D.  
65 Brompton Hospital, London, S.W. 3,  
ENGLAND
- 14th 1964- Elias Carapistolis, M.D., F.A.C.S.  
65 University Hospital A.H.E.P.A.,  
Surgical Clinic Department  
Aristotelian University of  
Thessaloniki, Thessaloniki, GREECE
- 15th 1965- Gerhard Friehs, M.D.  
66 Chirurgische University Klinik, Graz,  
AUSTRIA
- 16th 1965- Ary Blesovsky, M.D.  
66 London, ENGLAND
- 17th 1966- C. Peter Clarke, F.R.A.C.S.  
67 Cardiac Surgeon, The Royal  
Childrens Hospital,  
Flemington Road, Parkville, Vic.  
3052 AUSTRALIA
- 18th 1966- G. B. Parulkar, M.D.  
67 Thoracic and Cardiovascular Center,  
K.E.M. Hospital,  
Parel, Bombay 12, INDIA
- 19th 1967- Claus Jessen, M.D.  
68 Surg. Dept. D, Rigshospitalet,  
Blegdamsvej 9,  
Copenhagen, DENMARK

- 20th 1969- Peter E. Bruecke, M.D.  
70 A-1090 Vienna, Alserstrasse 4, 1st  
Surgical Clinic,  
Vienna, AUSTRIA
- 1970- Michel S. Slim, M.D.  
71 Department of Surgery, American  
University Hospital,  
21st Beirut, LEBANON
- 22nd 1971- Severi Pellervo Mattila, M.D.  
72 Department of Thoracic Surgery,  
Helsinki University Central Hospital,  
Helsinki 29, FINLAND
- 23rd 1972- Yasuyuki Fujiwara, M.D.  
73 Department of Cardiovascular  
Surgery, Tokyo Medical College  
Hospital,  
Shinjuku, Tokyo, JAPAN
- 24th 1973- Marc Roger deLeval, M.D.  
74 41 rue Louvrex, Liege B4000,  
BELGIUM
- 25th 1974- J. J. DeWet Lubbe, M.D.  
75 Dept. of Cardio-Thoracic Surgery,  
University of Stellenbosch  
P. O. Box 53 Bellville, REPUBLIC  
OF SOUTH AFRICA
- 26th 1975- Mieczyslaw Trenkner, M.D.  
76 Univ. of Calif., San Francisco, School  
of Medicine, Dept. of Sugery,  
San Francisco, California 94143 -  
POLAND