

## Literature Briefs

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Literature Briefs were submitted by Drs. C. M. Ballinger, R. B. Boettner, A. Boutros, D. R. Bucchel, R. B. Clark, M. I. Gold, W. H. Mannheimer, D. Morrow, J. W. Pender, L. J. Saidman, A. D. Sessler. Briefs appearing elsewhere in this issue are part of this column.

### Circulation

**CATECHOLAMINE MECHANISM** The effects of cyclic AMP and its dibutyryl derivative on the isolated cat papillary muscle preparation were studied. Because of inability to enter cells rapidly, cyclic AMP had no effect on the contractile behavior of papillary muscle, while the dibutyryl derivative increased both isometric tension and the rate of tension development. The effects of the derivative on papillary muscle were indistinguishable from those of norepinephrine, except that propranolol blocks the effects of norepinephrine and not those of the derivative. The dibutyryl derivative of cyclic AMP combines increased lipid solubility with resistance to degradation while mimicking the biological effects of cyclic AMP. This study provides further evidence that the positive inotropic response to catecholamines is mediated by an increase in the intracellular level of cyclic AMP. (Skellton, C. L., and others: *Positive Inotropic Effects of Dibutyryl Cyclic Adenosine 3', 5'-Monophosphate*, *Circ. Res.* 26: 35 (Jan.) 1970.)

**CARDIAC WORK IN HYPOXIA** The effects of three levels of steady-state work during steady-state breathing of 12 and 21 per cent oxygen were studied in 28 human volunteers using radioisotopic techniques to measure cardiac output and coronary blood flow. At a given level of oxygenation, coronary blood flow correlates well with cardiac work. When arterial oxygen content was low, relatively more coronary blood flow was necessary per unit of cardiac work. The correlation between

external work and cardiac work was poor since cardiac efficiency varied from patient to patient. (Johnson, P. C., and others: *Cardiac Output and Coronary Blood Flow in Steady State Exercise during Steady State Hypoxia*, *Aerospace Med.* 41: 12 (Jan.) 1970.)

**MYOCARDIAL METABOLISM** The electrolytic and metabolic responses to operation and whole-body perfusion for correction of congenital cardiac defects were studied in nine children. Whole-body metabolism did not differ in cyanotic and noncyanotic patients, but in the cyanotic group the myocardium tolerated periods of aortic clamping with less anaerobic glycolysis, compared with considerable lactate production during perfusion and anoxic asystole in the noncyanotic group. More severe ketosis developed postoperatively in children than in adults. The increase in serum insulin from the glucose load of the priming solution was greater in children than in adults. In spite of the availability of adequate glucose predominantly lipid was metabolized by the body for energy, as in starvation and stress. Nonesterified fatty acids continued to be the major myocardial energy-producing substrate, although lactate, ketone bodies, and pyruvate were also extracted. (Moffitt, E. A., and others: *Myocardial Metabolism in Children Having Open-heart Surgery*, *J.A.M.A.* 211: 1518 (March) 1970.)

**PULMONARY EMBOLISM** 126 patients who had fractures of the pelvis, hip, and shaft of the femur were divided into two groups at random and studied for incidence of pulmonary embolism. One group (49 patients) received 6 per cent dextran 70 in saline solution. The other group (77 patients) served as the control and received equivalent amounts of saline or lactated Ringer's solution. Dextran was given as follows: 200 ml during operation, 300 ml in the subsequent six to eight hours,