

CARDIOVERSION-INDUCED ARRHYTHMIAS The ability of diphenylhydantoin to prevent direct-current countershock-induced arrhythmias after digitalis sensitization was evaluated in dogs. Before digitalis, ventricular tachycardia could be produced by 155 watt-seconds. After ouabain (7.5 mg/kg) the arrhythmia threshold was 23 watt-seconds. Intravenous diphenylhydantoin (5 mg/kg) increased the arrhythmia threshold to 363 watt-seconds. Discontinuance of digitalis one to four days prior to cardioversion is recommended. If the clinical situation mitigates against discontinuation of digitalis, prophylactic administration of diphenylhydantoin may be of benefit in decreasing postcardioversion arrhythmias. (*Helfant, R. H., and others: Diphenylhydantoin Prevention of Arrhythmias in the Digitalis-sensitized Dog After Direct-current Cardioversion, Circulation 37: 424 (March) 1968.*)

HYPOXEMIA AND ACIDEMIA Cardiovascular responses to hypoxia induced by decreasing inspired O_2 tension and metabolic acidosis caused by infusion of lactic acid were studied in intact anesthetized lambs, three hours to 14 days of age. Compared with spontaneous breathing, positive-pressure ventilation induced only negligible changes. The averages of the largest responses to hypoxia were an 81 beat/min increase in heart rate and 60 ml/kg/min increase in systemic blood flow. During acidemia, heart-rate response to hypoxia was diminished and systemic blood flow usually failed to increase. In the absence of hypoxia, lactic acidemia produced mild tachycardia and a substantial increase in systemic blood flow. (*Downing, S. E., and Rocamora, J. M.: Cardiovascular Responses to Hypoxemia and Acidemia in the Intact Anesthetized Lamb, Yale J. Biol. Med. 40: 296 (Feb.) 1968.*)

CARDIAC FUNCTION Instantaneous pressure-flow-length relationships were examined in the intact heart of a patient with tuberculous pericardial effusion. Three small silver-tantalum clips were sutured to the sur-

face of the left ventricle and their positions monitored with a cinefluorographic camera and oscillograph. Pressures in the ascending aorta and right atrium were monitored with indwelling catheters. Instantaneous ascending aortic pressure and flow was obtained and an index of cardiac "fiber length" was estimated simultaneously with the cinefluorographic technique. The results indicate that for a given fiber length, there is a reciprocal relationship between blood pressure and flow. This finding is analogous to the force-velocity property of skeletal muscle. Also any value of instantaneous pressure, the flow was higher with increase in fiber length. These findings support the concepts that a force-velocity relationship exists in the intact human heart and that cardiac contraction can be described reasonably by the variables, instantaneous fiber length and instantaneous aortic pressure and flow. The precision of this data is not high, and other variables such as a change in the "active state" of the muscle during systole must be evaluated before a realistic model of the heart can be formulated. (*Greenfield, J. C., and Cox, R. L.: Instantaneous Pressure-Flow-Length Relationships in the Intact Human Heart, Amer. J. Med. Sci. 255: 288 (May) 1968.*)

EXTRACORPOREAL CIRCULATION

Factors affecting hemolysis during cardiopulmonary bypass were studied. Samples of blood were drawn from several sites of a Cross-Kay disc pump oxygenator during extracorporeal bypass in patients undergoing heart surgery. The defoaming substance, polymethylsiloxane, which coats the sponge in the defoaming chamber was found to reduce the resistance of erythrocytes to mechanical trauma, thereby significantly increasing the hemolytic action of bubbling, suctioning and defoaming. The addition of polyoxypropylene-polyoxyethylene, a water-soluble surfactant material, blocked the hemolytic process without interfering with antifoaming. (*Wells, R., and others: Influence of a Defoaming Agent upon the Hematological Complications of Pump Oxygenators, Circulation 37: 638 (April) 1968.*)