

can be judged. When the blood volume is reduced by less than 10 per cent, the arterial pressure is maintained primarily by the non-neural factors. With a volume reduction between 10 and 25 per cent, the sympathetic activity, the inhibition of vagi, and the non-neural factors are of about equal importance. When the reduction of blood volume is greater than 25 per cent, the sympathetic activity becomes the most significant compensatory factor. (Chien, S., and Billig, S.: *Effect of Hemorrhage on Cardiac Output of Sympsectomized Dogs*, *Amer. J. Physiol.* 201: 475 (Sept.) 1961.)

AURICULAR PRESSURE In five dogs and one human being, right auricular, intrathoracic (esophageal), intratracheal, and arterial pressures were measured during spontaneous respiration, manually controlled respiration, IPBB, and positive-negative phase respiration. Right auricular pressure is low during spontaneous inspiration, and elevated during expiration. The pressures in the right atrium show a direct relationship to those in the respiratory tract. With high insufflation pressures, the pressure in the right atrium is markedly increased and venous filling is diminished. The addition of a negative phase during expiration causes restitution to almost physiological conditions. The right auricular pressure curves resemble those obtained during spontaneous respiration. (Hanquet, M., and Lefebvre, L.: *Respiration Contrôlée et Pression Auriculaire Droite*, *Acta Anaesth. Belg.* 11: 381 (Dec.) 1960.)

VENTRICULAR TACHYCARDIA Quinidine and procaine amide are the most effective drugs for treatment of ventricular tachycardia, and the majority of episodes respond to these agents. However, in large doses, these drugs significantly depress myocardial contractility with resultant heart failure and shock. The object of electric countershock, whether the underlying arrhythmia is ventricular tachycardia or fibrillation, is to achieve simultaneous, uniform depolarization of all parts of the ventricle, thereby promptly extinguishing ectopic foci and permitting the sinus node to resume as pacemaker. When countershock is applied directly to the exposed heart, rela-

tively small amounts of current (50 to 150 volts) are employed; greater current, usually around 350 to 440 volts, is necessary when countershock is applied externally. The obvious advantages of electric countershock are that it is easily administered, the results are immediate, there is no lasting depression of cardiac function, and there are no serious after-effects. Combined with the safety factors of effective external pacemakers and external cardiac massage, this new technique may be the treatment of choice for ventricular tachycardia when anti-arrhythmic drugs have proven ineffective. (Alexander, S., and others: *Use of External Electric Countershock in the Treatment of Ventricular Tachycardia*, *J. A. M. A.* 177: 916 (Sept. 30) 1961.)

STARLING'S LAW Changes in effective left ventricular end-diastolic pressure were determined by measuring left ventricular pressure with a catheter introduced through the atrial septum, and intraesophageal pressure with a balloon. The activity of the autonomic nervous system was reduced with an infusion of trimethaphan administered at a constant rate. The reduction in circulatory reactivity was indicated by the absence of arterial pressure response to the cold pressor test. Measurements of cardiac output, stroke volume, left ventricular work, power, tension-time index, and the duration and mean rate of left ventricular ejection were carried out before, during and upon completion of a transfusion of 1,500 ml. of the subject's own blood. Transfusion resulted in a significant elevation of left ventricular end-diastolic pressure in each subject. As this occurred, left ventricular performance also became augmented. These data are consistent with the hypothesis that the end-diastolic pressure is an important determinant of the characteristics of ventricular contraction and that Starling's Law of the heart is applicable to man. (Braunwald, E., and others: *Studies on Starling's Law of the Heart. V. Left Ventricular Function in Man*, *J. Clin. Invest.* 40: 1882 (Oct.) 1961.)

BARORECEPTORS The relationship between pulmonary arterial pressure and the impulse activity recorded from pulmonary arterial baroreceptor fibers has been studied in

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anesthetized dogs. Threshold values of the baroreceptors were found to lie toward the lower end of the range of pressures usually quoted for the normal pulmonary arterial pressure in the dog. The baroreceptors signaled each rise in pressure above the threshold with an increase in the frequency of discharge and the number of impulses per cardiac cycle. In both intact and isolated pulmonary artery, pulsatile pressure was a more effective stimulus to the receptors than was a steady pressure. (Coleridge, J. C. G., and Kidd, C.: *Relationship Between Pulmonary Arterial Pressure and Impulse Activity in Pulmonary Arterial Baroreceptor Fibres*, *J. Physiol.* 158: 197 (Sept.) 1961.)

CARDIAC OUTPUT Cardiac output was measured with peripherally injected Evans blue T 1824 and a computing ear oximeter in 28 normal children (5 to 13 years) and 18 normal adults (24 to 54 years). The average values of 3.19 liters/minute/square meter in children and 3.06 liters/minute/square meter in adults confirm that the recognized relationship between cardiac output and body size for adults holds also for children of the size studied. There was no significant difference in the cardiac index of 17 children breathing 50 per cent nitrous oxide in oxygen and 11 others inhaling a mixture of 50 per cent nitrous oxide in oxygen plus 0.25 per cent halothane. (Jegier, W., and others: *Cardiac Output and Related Hemodynamic Data in Normal Children and Adults*, *Canad. J. Biochem. Physiol.* 39: 1747 (Nov.) 1961.)

ARRHYTHMIA Two factors, a sympathomimetic amine with cardiac actions and an increase in systemic blood pressure, are required for the consistent induction of bigeminy in cyclopropane-anesthetized dogs. In animals in which a large dose of dichloroisoproterenol (DCI) did not increase the adrenaline threshold for bigeminy, previously ineffective mechanical elevation of blood pressure induced bigeminy. Neither methoxamine nor DCI alone caused bigeminal rhythm, but their combination effectively induced bigeminy of long duration. (Sutter, M. C., and Dresel, P. E.: *Mechanism of Selective Blockade of Cyclopropane-Adrenaline Cardiac Arrhythmias by*

Dichloroisoproterenol, *Canad. J. Biochem. Physiol.* 39: 1783 (Nov.) 1961.)

BODY HEATING During fifty minutes of increased body temperature to 99.5–100.8° F. cardiac output increased 60 per cent from control values, mainly because of increased heart rate. Finger blood flow increased rapidly to reach an early maximum, but forearm blood flow increased gradually throughout the heating period. Increased limb blood flow was confined to skin vessels and average increase in cutaneous blood flow during heating was 1.8 liters/m.²/minute. (Kororexedis, G. T., Shepherd, J. J., and Marshall, R. J.: *Cardiovascular Response to Acute Heat Stress*, *J. Appl. Physiol.* 16: 869 (Sept.) 1961.)

CARDIAC ARREST Histological and histochemical changes in the myocardium of dogs after coronary artery ligation were compared with those in dogs subjected to extracorporeal circulation and induced cardiac arrest using potassium chloride, anoxia and anoxia with mild hypothermia. After coronary ligation there was nuclear rarefaction and almost total loss of glycogen in 5 to 20 minutes. After only total cardiopulmonary bypass for one hour, essentially no changes occurred. After 30 minutes of anoxic arrest, severe functional impairment of the myocardium and abnormal nuclear morphology were noted comparable to that noted after coronary artery ligation of 5 to 15 minutes. After anoxia and local mild hypothermia, variable improvement of histology was noted, although there was some postperfusion impairment in cardiac function. One hour after potassium citrate arrest, there appeared to be no histologic changes. However, there was extensive necrosis of the myocardium in the recovery period. Decrease in histochemical glycogen was greatest after coronary artery ligation, less after hypoxia with or without hypothermia and least if cardiac arrest was due to potassium citrate. (Miller, D. R., and others: *Selective Cardiac Arrest. Its Effect on Myocardial Structure and Function*, *Ann. Surg.* 154: 751 (Nov.) 1961.)

CARDIAC MASSAGE The brachial arterial pulse was recorded during cardiac massage in a patient who had an asystolic cardiac ar-

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