ABSTRACTS
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Abstracts

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ATHEROSCLEROSIS


In this study, lipoproteins were extracted from human atherosclerotic aortas. The material was extracted from the intima and, when suitably prepared, was thereafter treated exactly as the lipoprotein flotational preparations and analyzed in the usual manner. The observations indicate an almost perfect correlation among the plaques, the presence of a cardiovascular death, and the presence of the Sf 12-100 fractions in aortas. The most prominent lipoprotein fraction occurring in serum, the Sf 0-12 fraction was absent in these aortic extracts, regardless of the presence or absence of plaques. This would imply that the Sf 0-12 fraction is unassociated with atherosclerotic activity and is a normal component of serum. On the other hand, the Sf 12-100 fraction is always present in substantial amounts in aortas that show atherosclerosis. The presence of plaques and the Sf 12-100 fraction in the aorta appeared in 10 of 11 cardiovascular deaths. Even among noncardiovascular deaths, when plaques were present, substantial concentrations of this Sf 12-100 fraction were present, but the fraction was absent when the plaques were not found.

Waife


The authors describe 2 infants 25 days and 16 months of age respectively with extensive arteriosclerotic lesions involving the medium and small arteries of many viscera, including the heart. Characteristic is the fragmentation of the internal elastic membrane, intimal and medial calcification and fibroblastic intimal proliferation to the point of vascular occlusion. No intimal lipid deposition was found. Etiologic factors considered were renal disease, hyperparathyroidism, and vitamin D intoxication, and progeria, but these entities were absent in the 2 cases presented here.

Roentgenologic technics may demonstrate intimal and medial calcification, particularly applicable to visualization of opacified arteries in the extremities.

Schwedel


Administration of large doses of nicotinic acid to patients with hypercholesterolemia and an abnormally high ratio of beta-lipoprotein cholesterol to alpha-lipoprotein cholesterol (beta/alpha ratio) caused the pattern of the blood lipids to change toward normal in the majority of patients. The plasma cholesterol decreased significantly in 9 of 13 patients observed for 12 weeks and in 3 of 5 other patients observed for 4 weeks. The beta/alpha ratio was reduced in 11 of 13 patients observed for 12 weeks and in 4 of 5 patients observed for 4 weeks. The concentration of total lipids in the plasma was reduced in most of the patients but to a lesser degree than was the concentration of cholesterol.

Side reactions, consisting of flushing and pruritis, tended to diminish rapidly after the first few days of treatment. Urticaria, nausea, and vomiting, which were observed in a few patients, subsided when the drug was withheld temporarily and did not recur when administration was resumed.

Simon

In all of 79 persons with atherosclerosis and 17 with duodenal ulcers, chloral hydrate or amytal sodium in hypnotic doses caused decrease of serum cholesterol averaging 33 and 25 mg. per cent respectively, while phenamine and caffeine caused elevation averaging 25 and 26 mg. per cent respectively. Free and ester cholesterol were equally affected. The lecithin concentration, determined in a smaller group, showed a smaller and less constant rise after both phenamine and amytal sodium.

Lepeschkin


The hypcholesterolemic action of sodium 2-phenylbutyrate was investigated in a series of normal rabbits in which the drug was added to the diet. On the basis of control studies, it was found that the drug had lowered the serum cholesterol levels. Atheromatous lesions, however, were not significantly reduced in the aorta. The use of this agent was complicated by the occurrence of hemorrhagic kidneys in several treated animals.

Wessler


Relatively high doses of nicotinic acid seem to cause a decrease of serum cholesterol in human beings and in rabbits. When nicotinic acid was given rabbits together with cholesterol for 3 months, the development of atherosclerosis was inhibited or completely prevented in most of the animals.

Lepeschkin


The authors present a follow-up study of 50 persons with essential familial hypercholesterolemia, representing 12 families previously studied from 1941 to 1943. Hypercholesterolemia without xanthomatosis was the rule in children and young adults; hypercholesterolemia with xanthomatosis in older adults. In each individual xanthomatosis had a tendency to progress. Regression of the lesion was exceptional. Hypercholesterolemia was present from childhood. The serum cholesterol increased steadily from childhood until the fifth decade, after which it seemed to decrease. This corresponds with the findings in normocholesterolemic persons. Essential familial hypercholesterolemia was transmitted as a dominant. The occurrence of xanthomas was not conditioned by homozygous heredity but depended largely upon the level of serum cholesterol. Angina pectoris was common and coronary occlusion was the most common cause of sudden death, often at a relatively early age.

Harris


The effect of an orally administered mixture of $\beta$- and dihydro-$\beta$-sitosterols on the serum lipids of human subjects was investigated. Nine studies, including double-blindfold experiments on 5 normal subjects revealed an average mean fall of 13.0 per cent and an average maximal fall of 20.9 per cent in serum cholesterol during sitosterol therapy. One subject with xanthomatosis exhibited a mean fall of 20.3 per cent and a maximal fall of 31.5 per cent in serum cholesterol. Although her cholesterol level did not decrease to normal values, her $S_\text{r} 10-30$ lipoprotein fraction did. The xanthomatosa stopped growing during sitosterol therapy but again grew rapidly when sitosterol was discontinued. When sitosterol was administered, there was a rise in bile cholesterol concentration of a subject with biliary cirrhosis and a bile fistula. The significance of this observation cannot be evaluated, because the spontaneous fluctuations in bile cholesterol over prolonged periods of time are not known.

Subjects failing to take sitosterol immediately prior to eating did not exhibit sustained reductions in serum cholesterol levels. In some patients with disorders of lipid metabolism, a rise in serum cholesterol levels was noted during sitosterol administration. It is suggested that in these subjects either decreased absorption of cholesterol may stimulate increased endogenous production or small amounts of sitosterol may be absorbed, poorly removed from the circulation, and spuriously analyzed as cholesterol in the serum.

Bernstein


A case is presented of idiopathic hyperlipemia with severe coronary atherosclerosis, coronary occlusion, and myocardial infarction demonstrated at autopsy. Although idiopathic hyperlipemia is recognized to be associated with clinical coronary artery disease, this is the first recorded case of idiopathic hyperlipemia with postmortem evidence of coronary atherosclerosis. The vitamin-A-tolerance test revealed a marked decrease in tolerance, with extremely high levels of serum vitamin A at 5 hours, supporting the prevailing concept of the pathologic physiology of this entity, i.e., an impaired or delayed clearance of dietary fats from the serum. The treat-
ment of this disease consists of a low-fat diet, which often results in prompt alleviation of symptoms of angina pectoris and abdominal pain often seen in these patients. Heparin given intramuscularly or intravenously may be helpful if dietary control is not effective.

Bernstein

BLOOD COAGULATION AND THROMBOEMBOLISM


A new test is described for the quantitative estimation of the thromboplastinogen concentration of the blood. It is based on the principle of the prothrombin-consumption procedure modified by the addition of an extract of hemolyzed erythrocytes and plasma from a severe hemophilic. The method is sensitive to concentrations of thromboplastinogen less than 0.1 per cent of normal.

In severe hemophilia only a trace of thromboplastinogen is present in the blood and, even at a level of 0.5 per cent, the bleeding tendency is severe. A fairly close relation between the concentration of thromboplastinogen, the clotting time, and the severity of the bleeding state exists. A transfusion of fresh blood or plasma can elevate the level of thromboplastinogen in a hemophilic sufficiently to effect fairly normal, though temporary, hemostasis. Although the thromboplastinogen disappears fairly rapidly from the blood, as much as 0.5 per cent or more often remains 24 hours after a single transfusion of 500 ml. of blood in an adult.

Bernstein


An interrupted schedule of administering maintenance doses of warfarin sodium every third or fourth day has been tried and appears not to be satisfactory in view of the wide fluctuation of prothrombin levels. Administration of warfarin sodium guided by the daily prothrombin determination would seem to be the best method and, if a pattern is established, the prothrombin determinations can safely be reduced in frequency. Individual dosage requirements vary widely, but for the majority, after an initial dose of 75 mg., daily or every-other-day, doses of 12.5 mg. will satisfactorily maintain a proper hypoprothrombinemia.

Bernstein


Prolonged anticoagulant therapy is presently a part of the accepted treatment for certain illnesses associated with actual or threatened thromboembolic phenomena. The use of a variety of hypoprothrombinemia-producing drugs still carries danger of unforeseen and uncontrollable hemorrhage. The use of 50 to 100 mg. doses of vitamin K₁ emulsion administered intravenously will reverse the elevated prothrombin time. The use of vitamin K₁ intramuscularly is unpredictable. When the need for this vitamin is urgent, as in excessive and dangerous drug-induced hypoprothrombinemia, it should always and only be injected intravenously.

Kitchell


A case of hemorrhagic thrombocytopenia is reported. The patient had platelet counts reaching 10,000,000 per cubic millimeter and presented a variety of hemorrhagic manifestations. Undiluted, the platelets showed anticoagulant activity in the thromboplastin generation test but failed to show this activity when diluted to normal levels. Normal platelets showed similar anticoagulant properties when concentrated to thrombothrombic concentrations. It is suggested that the fundamental defect in hemorrhagic thrombocytopenia is a coagulation disorder resulting from the anticoagulant effect of excess platelets.

Bernstein

CONGENITAL ANOMALIES


The authors report 2 cases of Fallot's tetralogy with absent left pulmonary artery. Seventeen similar cases were found in the literature. The right pulmonary artery was absent in 1 patient with Fallot's tetralogy and dextrocardia. A right-sided aortic arch was found in 60 per cent of these 21 cases compared to 20 per cent in the ordinary type of Fallot's tetralogy.

In contrast, in 17 of 19 cases with 1 pulmonary artery and normal development of the bulbus cordis, the right was the absent one. These findings are best explained by Bremer's theory of the asymmetric development of the pulmonary arteries.

Soloff


The author reports a case of premature closure of the foramen ovale in a cyanotic and dyspneic infant who died 3 hours after birth. Eight other cases were found in the literature.
All 9 cases had progressive cyanosis leading to death. Microscopically, fibroelastosis of the left ventricular endocardium was found. These constant findings support the view that anoxia of the ventricular endocardium plays a part in the production of fibroelastosis.

**SOLOFF**


The author discusses some of the homeostatic mechanisms that come into play in congenital heart disease. Obstruction of blood flow and the shunt are the primary causes of disturbance in internal environment. The physiologic alterations in congenital heart disease can be divided into (a) disturbances in pressure and flow, and (b) disturbances resulting from the diminution of partial pressure of oxygen in arterial blood. In congenital heart disease the gradient between the PO₂ of inspired air and PO₂ of alveolar air is diminished because of hyperventilation. In the presence of a right to left intracardiac shunt there is a large drop between the oxygen tension of the alveolar and arterial PO₂ which obviates the effect of hyperventilation. The reduction in the final gradient in PO₂ from arterial to capillary blood can be due to 3 causes: the shape of the dissociation curve, the increase in cardiac output, and increase in the number of red cells. In congenital heart disease with cyanosis, the dissociation curve is the main factor in the diminution of the third or final gradient.

Under ordinary conditions hyperventilation produces either compensated or uncompensated carbon dioxide deficit, depending upon the severity and duration of the hyperventilation. If the carbon dioxide tension decreases proportional to the alkali reserve, the pH value of the blood remains constant. This occurs in the cyanotic type of congenital heart disease. There is a significant reduction in total carbon dioxide of blood; the pH remains within normal range. Consequently the reduction in alkali reserve must have been accompanied by decrease in the partial pressure of carbon dioxide. Patients with congenital heart disease generally have low alkaline reserve. An increase in the red cells and the hemoglobin of blood is constant in the cyanotic type of congenital heart disease. In all likelihood a humoral substance is released that produces increased erythropoiesis. Hypochromia due to defective iron assimilation is a common feature of congenital cyanotic heart disease. In addition to the physicochemical adjustment to anoxia there are also circulatory regulatory mechanisms in the cyanotic congenital heart disease. These include the development of collateral circulation to the lung and postural effects that can increase the arterial oxygen saturation.

**HARRIS**


Angiocardiography in a 4-year-old girl showed complete atresia of the left main branch of the pulmonary artery and stenosis of the right branch, while in a 21-year-old woman it showed complete atresia of the main trunk and of the right main branch, with persistence of the ductus arteriosus. In such cases temporary clamping of one of the branches during the Blalock-Taussig operation may be very dangerous.

**LEPESCHKIN**


While cases of mirror-image dextrocardia show complete inversion of all waves in lead I, those of dextroposition about a sagittal axis show normal P and QRS in lead I. The 2 cases described here showed normal precordial leads, but the transition zone was displaced to V₁-V₃ or V₂-V₃; 1 case showed transient inversion of T in lead I during an acute abdominal inflammation. In a case of dextroversion about a vertical axis, which is always congenital, P was upright in lead I but deep Q waves and inverted T waves were present in leads I and II; rS was present in V₆r, Rs in V₆r, and QR in V₃ through V₄. The x-ray showed the aorta to be on the left side, the heart completely on the right side.

**LEPESCHKIN**


Following review of the literature and description of a personal observation, anatomic, clinical, and diagnostic features of Ebstein's disease are discussed. It is defined as a malformation of the tricuspid valve, the insertion of which is displaced toward the apex of the heart. In most cases this is associated with patency of the foramen ovale and pronounced dilatation of the right heart. The condition is not particularly rare and often well tolerated (cases surviving to 60 years and more have been reported). The main danger consists in a hyperexcitability of the myocardium, which can result in sudden cardiac death. For this reason catheterization is dangerous and should be avoided, particularly since the diagnosis can be made without difficulty on clinical grounds. Presenting clinical signs are cyanosis, dyspnea, and often right heart failure. On fluoroscopy, the heart is enlarged with feeble contractions and the lung fields are very translucent. The electrocardiogram shows in 90 per cent a right bundle-branch block; the P waves are often unusually tall. Additional abnormalities found are a P-R prolongation and sometimes the Wolff-
Parkinson-White syndrome. Angi cardiography reveals dilatation of the right heart chambers, the presence of an intratral communication, slow emptying of the right ventricle, and poor opacifica
tion of the pulmonary arteries, and sometimes segmentation of the right ventricular shadow. An 
attempt at surgical correction is dangerous and, in 
the opinion of the authors, contraindicated.

**Pick**

Downing, D. F., and Goldberg, H.: Cardiac Septal 
Defects II. Atrial Septal Defect. Analysis of One 
Hundred Cases Studied During Life. Dis. Chest 
29: 492 (May), 1956.

One hundred consecutive patients in whom an 
atrial septal defect was demonstrated and who were 
studied by right heart catheterization were an-
alyzed. The malformation produced symptoms in the 
majority of patients. Cardiac failure was common, 
and the authors were convinced that one reason 
for the oft-repeated view that atrial septal defect is 
commonly complicated by pneumonia is the im-
proper interpretation of signs of heart failure. The 
most characteristic roentgen feature was the 
presence of marked dilatation of the left and right 
branches of the main pulmonary artery. This was 
seen much less frequently in other lesions allowing a 
left to right shunt. The electrocardiogram showed 
evidence of right ventricular hypertrophy in the 
majority. Right bundle-branch block was less than 
half as common. Although pulmonary hypertension 
was found very frequently, the pressure tended to be 
lower than in ventricular septal defects. The left-to-
right shunt, on the other hand, tended to be greater. 
The mechanism of development in both atrial and 
ventricular septal defects of pulmonary hypertension 
is the same. However, initial and potential flow 
through a defect in the interventricular septum is 
greater than that through one of similar size in the 
atrial septum. The stimulus to pulmonary vascular 
changes is greater and the necessity more acute in the 
former.

There are no characteristic historical or physical 
findings. Although right bundle-branch block and 
marked dilatation of the primary branches of the 
pulmonary artery in a patient with a systolic mur-
mur at the base allows one to be very suspicious of 
the presence of an atrial septal defect, the diagnosis 
depends upon cardiac catheterization.

Patients may be divided into 5 classes so far as the 
desirability of surgical closure is concerned. The 
magnitude and direction of shunt through the 
defect and the height of pulmonary pressure are the 
basic considerations. Defects in the septum just 
above the atroioventricular valves are extremely 
difficult to close if there is not at least a small rim of 
septal tissue in the area; and the attempt is ex-
tremely hazardous because of the possibility of in-
juring conduction tissue or of destroying the 
integrity of either of the atroioventricular valves 
which lie so close. Unfortunately, at the present time 
only surgical exploration allows diagnosis of the 
anatomic conditions, and whether or not surgical 
correction can be attempted.

**Maxwell**

Puštan, J., and Gehmacher, K.: The Peripheral 
Rheogram in Congenital Heart Disease. Ztsch. 

Observations in 45 cases show that in persistent 
ductus the beginning of the pulse wave in the 
electric plethysmogram is earlier, the entire duration 
is shorter, and secondary waves are less pronounced. 
In coarctation of the aorta the curves in the lower 
extremities begin later and become more similar to 
sinusoidal oscillations. The later appearance of the 
apex in Fallot's tetralogy can be explained by a dif-
f erent course of aortic ramifications. The changes in 
other types of congenital disease are less constant.

**Lepeschkin**

Bär, C. G.: The Electrocardiogram in Hypertension. 

Of 60 patients with coarctation submitted to 
operation, 17 had normal electrocardiograms; 
among these were cases with systolic pressures ex-
ceeding 200 mm. Some of these cases had high 
voltage in the precordial leads, which was present 
in a total of 40 cases. Twenty-two patients showed low 
T and depressed S-T in left ventricular precordial 
leads and 12 also had incomplete right bundle-
branch block; of these, only 3 showed increased 
right ventricular pressures. Four of the 6 cases with 
persistent ductus arteriosus had a right ventricular 
hypertrophy and strain pattern. After end-to-end 
anastomosis of the aorta the electrocardiographic 
changes disappeared completely in half the cases, 
and incompletely in the rest. The normalization was 
parallel to normalization of the blood pressure and 
took place at a time when the roentgenologically 
determined left ventricular hypertrophy and the 
high voltage were little changed. It is concluded that 
the left ventricular strain pattern is the result of 
functional rather than anatomic changes in the 
heart.

**CORONARY ARTERY DISEASE**

Bakst, A. A., Maniglia, R., and Bailey, C. P.: The 
Physiologic Explanation of the Changes in the 
Coronary Circulation Following Prolonged Aor-
35: 302 (March), 1956.

In 2 groups of dogs, the coronary sinus was 
arterialized by a venous graft between the aorta and 
coronary sinus. With the graft open, the coronary-
sinus pressure was within the range of the systemic 
circulation, and the coronary sinus blood was of high 
oxgen content. When the graft was occluded, both 
pressure and oxygen content reverted to those of the
normal coronary sinus. However, the authors were unable to demonstrate any retrograde perfusion of the myocardial capillary bed. After 6 months of aortico-coronary sinus arterization, neither the quantity nor the oxygen content of the retrograde coronary arterial flow was affected by the presence or absence of a functioning sinus vein graft. The authors were unable to demonstrate any protective effect upon the myocardium against ventricular fibrillation following coronary arterial occlusion.

**Waife**


A significant rise in the serum aminopherase (transaminase) level after myocardial infarction has confirmed the earlier observations of other workers. Forms of heart disease unassociated with myocardial tissue damage have not demonstrated this rise. The authors, however, noted significant elevations above the normal controls (which ranged from 10 to 45 units per milliliter of serum) with skeletal muscle necrosis, liver disease, and with infarction of the liver and other abdominal viscera. It is concluded, therefore, that elevations in serum aminopherase level are associated with cellular injury of various tissues and are not related specifically to myocardial damage. Because significant elevations in serum aminopherase level do occur in a variety of clinical conditions, the physician must interpret the results of this test in the light of the entire clinical picture.

**Kitchell**


Two hundred fifty hearts with gross myocardial scars indicative of healed infarction were selected from necropsies performed at the Mayo Clinic during the 5-year period 1946 through 1950 and studied with regard to the pathologic anatomy and its correlation with the clinical features. The cause of death was primarily of cardiac origin in nearly two thirds of the patients. There were 3 major types of cardiac death: death from congestive heart failure, death from recurrent acute myocardial infarction, and “sudden death” without congestive failure or acute infarction. The last-mentioned mechanism was the commonest of the 3 and was infrequently associated with recent coronary thrombosis.

For the patients whose acute myocardial infarction was diagnosed clinically the average length of survival following recovery from the acute episode was 43 months. Only 24 per cent of these patients survived 5 years or more, and only 7 per cent survived 10 years or longer. The period of highest mortality was within the first year after the acute illness. From the standpoint of cardiac morphology and clinical features the patients surviving 5 years or longer did not differ significantly from those of the entire series. Hence, it was concluded that the subsequent course of patients who had survived an episode of acute myocardial infarction could not be accurately predicted on the basis of morphologic or clinical findings.

**Bernstein**


Data pertaining to some epidemiologic aspects of acute myocardial infarction were obtained from a survey of the autopsy and clinical records of Washington University and Barnes Hospital, covering the period 1910–1954. The incidence of acute myocardial infarction was established in this large autopsy series (500 among 8183 adults) as a basis for comparison with other similar groups. The incidence of acute myocardial infarction has increased tremendously in all age groups in this autopsy series in the last 45 years. The incidence is 20 times greater in the decade 1945–1954 than in the decade 1910–1919. This increase is explained at least in part by the changing character of medical care and illustrates the necessity of taking into account the local customs regarding medical care in analyzing data from other parts of the world. However, the increase may reflect, in part, an actual increase in the incidence of the disease in the population and may be related to some changing factors in our civilization.

The most remarkable observation made is that the incidence of acute myocardial infarction in the 2 sexes differs only slightly when the proportion of men to women in the entire autopsy series is taken into consideration (1.2 males to 1 female). Even more remarkable is the observation that a change in this ratio occurred about 1940. For the period 1910–1939 the corresponding ratio was 2:1. For the period 1940–1954 it was 1.1:1. The fact that there were more patients with acute myocardial infarction in the autopsy series after 1939 than prior to 1939 accounts for the 1.2:1 ratio for the entire period 1910–1954. The data obtained from this series support previous observations indicating that the peak of incidence occurs later in women than in men. The incidence is proportionately higher in white persons than in Negroes in this series. Diabetes mellitus was much commoner among patients with acute myocardial infarction than it was in the general autopsy population.

In dogs after experimental myocardial infarction and in human beings suffering from coronary occlusion, the plasma levels of transaminase, aldolase, isomerase, and malic acid dehydrogenase are increased. The release of enzymes into the plasma was correlated with the extent of muscle necrosis. The additional observation in dogs of negative pyruvate balance (higher concentration of pyruvate in coronary sinus than in arterial blood) appeared to be an immediate response of hypoxic myocardium.

Aviado


In 4 fatal cases of acute myocardial infarction, 3 of whom were autopsied, there developed during the early phase of the illness, a rough systolic precordial murmur. This was interpreted during life to indicate that a perforation of the interventricular septum had occurred. In the autopsied patients the diagnosis was confirmed. No characteristic electrocardiographic changes were noted that would have been helpful in substantiating the clinical diagnosis of septal rupture.

Wendkos


The glycolytic enzyme, aldolase, is found in both skeletal and cardiac muscle and may be expected to be increased in serum in myocardial infarction due to its release from damaged cells. To investigate this assumption, 22 dogs were subjected to coronary artery ligation and 8 patients with myocardial infarction were studied. Serum aldolase measurements were determined daily on the experimental animals and patients. In 12 dogs, the descending branch of the left coronary artery was ligated just below the bifurcation and in 10 dogs a low ligation was performed. There was a prompt rise of serum aldolase in the coronary-ligated dogs. A semiquantitative relationship was found between the areas of myocardial necrosis and the levels of serum aldolase in these 2 groups of animals. In patients with acute myocardial infarction a rise in serum aldolase was noted that approximated the severity of the clinical course. In 5 additional patients with coronary insufficiency there was no rise in serum aldolase. The simplicity of the procedure may recommend it as an additional tool for the diagnosis and evaluation of therapy and prognosis in patients with myocardial infarction.

Shuman


Daily eosinophil counts were performed in 149 patients in the early phase of acute myocardial infarction to evaluate the effect of the condition upon the nonspecific index of stress. In the great majority of patients an early eosinopenia of 2 days' duration or more was found. The decrease in eosinophils usually developed within a period from 5 to 48 hours. Of the counts made on the first, second, and third days only 3, 6 and 15 per cent respectively were above 50 per mm. In 81 patients with eosinopenia of less than 7 days' duration, only 2 patients died. In 23 patients with prolonged eosinopenia, 16 patients died. A normal eosinophil count in the period from 5 to 48 hours following symptoms suggestive of myocardial infarction strongly contradicts the diagnosis. An early eosinopenia was found frequently in pneumonia, pulmonary embolism, arrhythmias, acute congestive failure, and gall-bladder disease. Uncomplicated angina pectoris was not associated with significant eosinopenia. A reduction of eosinophils is of no value in the differential diagnosis of myocardial infarction as regards diseases involving severe stress but may be of aid as regards uncomplicated angina pectoris.

Shuman


Tracer amounts of I131 in normal saline, ranging from 0.5 to 1.0 microcurie, were injected by hypodermally into the thighs of 35 patients with acute myocardial infarction. The rate of disappearance of the radioactive tracer was recorded either until half the radioactivity had disappeared or for a period of 30 to 60 minutes. In healthy control subjects, the disappearance of half the tracer was achieved in a mean time of 9 minutes. In those with myocardial infarction, greatly prolonged clearance times were observed during the first few weeks of illness. The clearances became normal in the sixth week in the majority of patients. It was noted that, in a number of patients, the I131 clearance remained prolonged in the sitting position after having become normal in the supine position. This finding may be attributable to a decrease in cardiac output in the sitting position. The mechanism of delayed clearance of tracer amounts of I131 in patients with myocardial infarction may be that of a diminution of the peripheral capillary bed.

Shuman

ABSTRACTS

943

One hundred and sixty-five cases of recent myocardial infarction were analyzed as to history, symptoms, and signs and evaluated according to the point system proposed by Schnur. The following were found to represent factors with unfavorable prognostic significance: advanced age, female sex, shock, congestive failure, azotemia of more than 60 mg. per cent, disturbances of rhythm, thromboembolic accidents, and a previous myocardial infarct. Diabetes and hypertension, according to this study, are not important in prognosis.

PICK


In states of coronary insufficiency that are suspected of being a prelude to coronary thrombosis, anticoagulation is now being applied with seeming success to forestall intravascular thrombosis with secondary myocardial infarction. It is important, therefore, to attempt to predict oncoming myocardial infarction in patients with known coronary disease. It is believed that such prediction is possible when changes in the pain pattern supervene or when certain new symptoms appear. In those patients in whom there is a distinct crescendo in the frequency and intensity of anginal attacks, and where there is gradual broadening of the site of radiation with the development of sweating and often vomiting, and where attacks have become quite severe and frequent, major myocardial necrosis is very likely to occur within a matter of hours or days. Significant of oncoming myocardial infarction is pain which previously brought on with some regularity by a certain degree of effort or emotion becomes provoked more quickly and with greater frequency and intensity by the same precipitant. More important is pain, previously occurring on effort, that now appears at rest and most dramatically occurs in the early hours of the morning, awakens the patient, persists for a long time, and is not relieved by glyceryl trinitrate.

WENDKOS


Choline theophyllinate was tried in 72 ambulatory patients with angina pectoris. Forty-two cases received the drug, while 28 received a placebo. Neither the patient nor the doctor knew whether the drug or the placebo was used (double-blind method). The results proved that, in the majority of cases, no suggestive influence was involved in the results. No sedative effect was ascertained and tolerance was good.

The clinical improvement resulting from the drug was remarkable but gradual in its onset. It was revealed by a decrease in the number of the attacks of pain and in their severity, as well as in the partial or total discontinuance of nitroglycerin. Working capacity and the ability to walk without pain were also increased.

The electrocardiogram at rest improved only in a few exceptional cases. The electrocardiogram recorded after a 2-step test was usually comparable to that recorded prior to therapy. However, this apparent lack of change was due to the fact that most patients were unable to complete the test before therapy but could complete it afterwards. When the number of steps in the tests before and after treatment were identical, no changes followed exertion after therapy in some cases, in contrast with the deterioration of the tracing produced by exertion before therapy. This represented an objective evidence of the effect of the drug.

It is concluded that the effects of the drug are not due to its vasodilating action. It is probably due to an action on the enzyme systems of the myocardium or to the local neutralization of pressor amines that interfere with oxygen utilization in the myocardium.

WENDKOS

ELECTROCARDIOGRAPHY, VECTORCARDIOGRAPHY, BALLISTOCARDIOGRAPHY, AND OTHER GRAPHIC TECHNICS


The authors report a comparative study of the preoperative cardiac examination in 184 unselected patients with cancer scheduled for major surgery. The evaluation of these patients by the ballistocardiogram was compared with that obtained by the history, physical examination, and electrocardiogram. Mortality and morbidity were higher among patients showing abnormal ballistocardiograms. The results indicate that the ballistocardiogram may be a valuable tool in the preoperative evaluation of myocardial function, for it appeared to be more sensitive than the history and physical examination in detecting a cardiac abnormality, which might adversely affect the postoperative course.

SAGALL


This report deals with a description of the normal vectorcardiogram based on vectorcardiograms and electrocardiograms taken on 100 healthy patients with normal hearts (14 women and 86 men). The Trihedron reference system was used. More than half the subjects were between 20 and 30 years of
age. The QRS loop was arbitrarily divided into initial forces, body, and terminal appendage. The initial forces were defined as forces at the beginning of the QRS loop, which are oriented to the right or superior to zero. The terminal appendage was arbitrarily taken to mean the forces at the end of the QRS loop, which are oriented to the right or superiorly. The body usually appeared as a hemispherical projection in the horizontal and sagittal planes, and was composed of a centrifugal and centripetal limb joining the initial forces and the appendage. The body had a leftward and inferior position and usually was oriented both anteriorly and posteriorly, rarely entirely anteriorly. A detailed study is given of the general morphology, position, and magnitude of QRS and T vectors, their direction and speed of inscription, the interrelations of various portions of the QRS loop, and of the latter to the T loop. The results by the method of analysis used in this series of normal subjects have been tested against the vectocardiograms as found in right and left ventricular hypertrophy, myocardial infarction, right and left bundle-branch block, intraventricular block, and pulmonary embolism, and have been found to constitute a valid basis for differential diagnosis.

Rinzler


This report deals with a method for T-wave mirror-pattern cancellation that determines the degree of dipolarity and the location of the electric center of ventricular repolarization. Two individuals, whose equivalent dipole location for ventricular depolarization had previously been determined, were studied. The authors conclude that repolarization, as well as depolarization, is dipolar in nature and that the heart acts approximately as a dipole. In 1 individual the equivalent dipole location for ventricular repolarization was 4 cm. distant from that for depolarization, but in the other the distance between these 2 centers was only 1 cm.

Rinzler


This report deals with 127 consecutive left heart catheterizations in 120 patients. Patients considered to have clinically significant lesions of the mitral and aortic valves were selected for this study and 90 per cent of these patients had subsequent cardiac surgery. Catheterization was performed through a sharp 18-gage thin-walled styletted needle, 6 inches in length. The technic of atrial puncture is described. Atrial premature systoles were frequently observed as the needle invaginated the left atrium. Polyethylene, polyvinyl, or Nylon catheters were passed through the needle. Intracardiac and intravascular pressures were measured. The complications have consisted of hemopericardium (80 per cent) of no clinical significance and requiring no specific therapy. Hemothorax occurred on 6 and pneumothorax on 3 occasions. Sudden death occurred in 1 patient 12 hours after the procedure.

Rinzler


The continuous curves of the time courses of volumes, rates, and accelerations in inflow, outflow, and differences between inflow and outflow in the digit during a single pulse cycle are amenable to various quantitative analyses. These analyses permit a better definition of digital blood flow and provide an additional approach to the study of the physiologic mechanisms responsible for the central and peripheral circulatory states in health and disease. Selected analyses are presented of more than 300 such digital rheoplethysmograms of 10 normal and abnormal subjects. Among selected analyses presented are one that simplifies a comparison of the relative proportions of total digital inflow and outflow for any segment of the pulse cycle, one that demonstrates readily the moment-to-moment lag in outflow with respect to inflow, one that describes temporarily the variations in volume inflow as a percentage of total inflow, and one that may serve as a possible index of the circulatory reserve. Differences in the state of the peripheral or central portions of the circulation are readily reflected in these various curves of the rheoplethysmogram, such as those observed for the resting state, vasoconstriction, aortic valvular insufficiency, and other states discussed in this report. In general, the increase or decrease in digital inflow was essentially symmetric and proportional throughout the pulse cycle, even with extreme vasoconstriction or vasodilatation. Particularly significant exceptions were noted in some subjects with aortic valvular insufficiency. The rate of digital flow was observed to be essentially as rapid as that reported for the brain, was over 50 per cent of that reported for the liver, about one eighth of that reported for the kidney, and several times that reported for the body as a whole.

Rinzler


The aperiodic ballistocardiogram has been designed with mechanical constants selected to eliminate tissue distortion. This report deals with the normal aperiodic ballistocardiogram as a function of age and uses an instrument modified from Wittern’s. The records of 73 normal subjects ranging in age from 2½ to 87 years form the basis of this report. The wave form of the “aperiodic” ballistocardiogram varies with age and force direction, though the shape of the record for any single individual is a unique and highly reproducible characteristic. Progressive shift of the frontal plane vector toward
the transverse axis of the body begins at approximately age 40. Bidirectional recordings are therefore essential in the age group of primary clinical interest. Respiratory variation cannot be explained on the basis of change in force direction. Though reversed respiratory variation is highly significant in subjects under 40, it may be entirely normal beyond age 50. The most important fact elucidated by this study is that reaction force remains constant throughout adult life. The hemodynamic alterations responsible for constant force output despite progressive decrease in stroke volume and contractility are discussed. Although the "aperiodic" ballistocardiogram has proved to be a valuable clinical and investigative tool, the complexity of instrumentation and interpretation precludes its use as a "service" diagnostic procedure in its present state of development.

RINZLER


The authors have analyzed the electrocardiographic alterations of the QRS complex after myocardial infarction in the posterior, lateral, septal, anterior, and combined areas by the method of analysis developed and described by Gardberg and Ashman in 1943. Illustrative electrocardiograms show the effects on the QRS complex of varying positions of the heart. Since preinfarction electrocardiograms were available for all the demonstrated patterns, a comparison was made before and after infarction. The authors also point out that QRS changes resulting from myocardial infarction depend to a large extent upon the size of the involved area and its location: i.e., epicardial, endocardial, intramural, or transmural. Recognizing the distinction between the normal and pathologic electrocardiogram is frequently impossible and proper evaluation is achieved through a physiologic approach: thinking of the QRS complex of the electrocardiogram in terms of a QRS loop. The authors conclude that in the state of our knowledge of the electric phenomena concerned in electrocardiography and the variable factors of eccentricity and contour, it is desirable to continue recording electrocardiograms in the conventional manner rather than by spatial vector technics.

RINZLER


Thirty-four patients with no clinical evidence of heart disease but with electrocardiograms showing RS-T segment coving and frank T-wave inversion in the left and mid precordial leads were given a vagal blocking agent (Pro-Banthine). This resulted in prompt normalization of the electrocardiographic abnormalities. Hyperventilation, performed for 10 to 20 seconds consistently reproduced the original RS-T and T-wave changes. This hyperventilation effect was blocked, however, during the period of peak Pro-Banthine activity. It was noted that vasmotor instability, anxiety, and hypochondriasis were prominently manifested by these patients.

RINZLER


The electrocardiogram of a 5-month-old infant showed inverted P, deep Q and wide, tall R waves in leads I and II, while leads V6 through V2 had RS deflections with the tallest R wave in V2; leads V3 to V5 showed wide Q and tall R waves. At autopsy a single ventricle was found; the aorta originated from the anterior hypertrophic part. The atria were situated normally, with the right atrium showing greater hypertrophy. This case shows that inverted P waves in lead I do not necessarily indicate situs inversus of the atria. A second patient showed deep notching of the T wave in leads II and III, which simulated 2:1 atrioventricular block. Forced respiration caused sinus arrhythmia, which allowed recognition of the notch as belonging to the T wave.

LEPESCHKIN


A capsule connected to a piezoelectric crystal is held to the neck by means of suction applied to a circular space surrounding it. Only the pulsation of superficial jugular vein affects the pressure in the internal space, so that the venous pulse registered in this way is little affected by the pulsation of the carotid artery.

LEPESCHKIN


The precordial rheogram (impedance plethysmogram), in the lead from the right shoulder to the heart apex, shows extreme elevation of the protodiastolic venous wave in tricuspid insufficiency. The rheogram of the arm shows a corresponding second venous wave after a conduction time of about 0.14 second. These waves are present also in cases not showing tricuspid regurgitation and are caused by a temporary increase in venous engorgement at the beginning of diastole. The venous wave in the arm disappears after ligation of the inferior vena cava. The rheogram in the lead from the right to the left jugular vein shows a systolic plateau in tricuspid regurgitation.

LEPESCHKIN
HYPERTENSION


The authors feel that the evidence does not support the idea that Rauwolfia per se induces a depression. It is much more likely that the effect of the medication upsets the psychological balance upon which the patient's ability to get along with himself and others has depended all his life. This alteration seems to create a vulnerability in the patient, such that the usual stresses and strains of this age period tend to bring on a depression. The drug, apparently has a different action when used with overactive, disturbed psychotic persons than when given to tense, anxious, inhibited psychoneurotic individuals. Reports on its use in psychoneuroses are pertinent here. It apparently acts initially as a sedative without soporific action and lessens anxiety. As its use is continued, it seems to be a "deinhibitor." It is reported to free the neurotic from the constriction of his defense system, and patients report enthusiastically about their feeling of freedom. This lessening of inhibition makes the patient more likely to express real feelings of anger. If he does so however, he is immediately threatened, as he sees it, with the withdrawal of his security needs by significant people in his environment who represent the mother-figure of his childhood. Thus a depression ensues upon rather minor shifts of attitude in his interpersonal environment. A depression, it should be noted, serves as an effective defense against the expression of unacceptable angry feelings.

The authors conclude that the possible complication of depression should not preclude the use of this drug that has been shown to have beneficial effects in a large percentage of hypertensive patients. It should not, however, be used indiscriminately but only under supervision, not to observe the effects on the blood pressure, but more particularly for any evidence of depression. There was no apparent correlation between the emotional responses to Rauwolfia and the effect on the blood pressure.

Simon


Reserpine was administered to a group of 25 hypertensive patients of which 23 were female; 17 of the entire group were Negroes. The objective studies included blood pressure readings, pulse rate, fundoscopic examinations, and electrocardiograms obtained before and during the course of treatment. The results indicated that no remarkable fluctuations in blood pressure occurred; a slight lowering of pulse rate was noted. There was some improvement in several electrocardiograms, which could not be attributed to lowering of blood pressure. Side effects were noted in approximately two thirds of the patients including muscle pains, nasal stuffiness, drowsiness, headache, nausea, and vomiting. The authors conclude that the environmental factors are important in contributing to the results obtained with reserpine therapy in hypertension.

Shuman


The authors review the pharmacologic tests used in diagnosing pheochromocytomas, emphasizing the precautions necessary to avoid false results. In the normotensive phase a cold pressor test should always precede the histamine test, and the latter must demonstrate a rise of at least 60 mm. systolic and 40 mm. diastolic to be significant. Moreover, the blood pressure rise must be substantially above that of the cold pressor test, the average difference in 19 patients being 70 mm. systolic and 19 mm. diastolic. A regitine test may be performed at the height of the blood pressure rise following histamine, and a rapid fall in blood pressure represents 2 positive tests. In the presence of sustained hypertension a regitine test of 5 mg. intravenously should yield a significant drop in blood pressure in 30 to 60 seconds, with a slow return to previous levels. Regitine should not be administered intramuscularly as false negative results occur. No sedation or narcotics should be given for 48 hours prior to these tests, as the cold pressor response may be suppressed and the response to regitine or piperoxan accentuated leading to false positive results. The authors also mention 4 reported cases of intrathoracic pheochromocytomas, in 2 of whom successful surgical procedures were carried out. Two patients with recurrent metastases from surgically removed pheochromocytomas are also discussed.

Maxwell


Results obtained in the treatment of hypertension with mecamylamine, a ganglionic-blocking drug, which is completely absorbed from the intestinal tract, are reviewed. The patients were treated as ambulatory patients. The drug is an effective agent for reducing the blood pressure in patients with severe hypertension. Because of its complete oral absorption, it is more predictable from day to day, and dosage is easier to titrate, since the oral and
parenteral route of administration can be used interchangeably with the same dose.

The side effects with mecamylamine are similar, both qualitatively and quantitatively, to those observed with other available ganglionic-blocking agents, such as hexamethonium and pentolinium. The effect of reducing salivation is more marked with mecamylamine than with the other blocking agents, and the initial effect of reducing intestinal peristalsis may be more marked than with other blocking agents. The pharmacology and specific clinical problems relative to the use of this drug for the treatment of hypertension are reviewed.

Bernstein


Mecamylamine seems to be completely absorbed from the intestinal tract of man. The hypotensive effect began after 1 hour, reached the lowest values at 2 hours and disappeared in 6 to 12 hours. In equipotent hypotensive doses mecamylamine did not produce as marked an inhibition of sympathetic vasoconstrictor reflexes as had been observed previously with hexamethonium. In 36 patients with severe hypertension treatment with mecamylamine in an average dose of 29 mg. per day was followed by a mean reduction in blood pressure of 21 per cent systolic and 16 per cent diastolic in the supine position and 25 per cent systolic and 20 per cent diastolic in the erect position.

Continuous treatment for 1 to 4 months frequently resulted in improvement in the optic fundi and occasionally in the electrocardiographic patterns. A decrease in blood urea nitrogen levels also was noted in most patients exhibiting slight elevations but not in those with marked nitrogen retention. The side effects were typical of those experienced with other ganglionic-blocking agents. In the majority of patients the development of “tolerance” was slight or nonexistent. The addition of small doses of hydralazine appeared to produce a slight additional hypotensive effect in 3 of 13 patients. Reserpine seemed to produce an additional hypotensive effect in 5 of 11 patients.

Bernstein

METABOLIC EFFECTS ON CIRCULATION


In 21 normal young persons accustomed to smoking, inhaling the smoke of 1 cigarette caused in all cases an increase of leukocyte concentration and decrease of eosinophils. In most cases the neutrophils increased and blood sugar showed an initial decrease, with later increase, while the potassium concentration decreased. In a minority of cases the lymphocytes, the blood sugar, and the serum potassium showed an immediate elevation. Five anesthetized dogs behaved like the majority of human subjects. The serum sodium and calcium were not affected.

LepeschkIn


In this review article the author discusses the cardiac changes (physiologic and anatomic alterations) that have been produced in the experimental animal by deficiencies of various inorganic elements, amino acids, vitamins, and fatty acids. The application of these findings to an understanding of the changes seen in human beings with nutritional deficiencies are indicated.

Sagall


Small concentrations of compounds B, F, E, and S have a positive inotropic effect on hypodynamic cat papillary muscles. Higher concentrations of these and all concentrations of DCA and compound A depress papillary muscle. Ten per cent serum, 1 per cent serum albumin, and a diastole of 1 per cent albumin are all positively inotropic. The steroids did not account for this positive action.

Oppenheimer


The organization of a project designed to evaluate man’s requirement for vitamin E was described. This project is still in progress. Quantitative tests included evaluation of creatine, creatinine, nitrogen, pentose, and a rough estimation of amino acid distribution in urine. Plasma was analyzed for tocopherol content, total fatty acids, linoleic, linolenic, and arachidonic acids, cholesterol, vitamin A, and carotenoid substances. Hemograms, liver function studies, tolerance curves for glucose, lactic acid, and pyruvic acid were obtained. Clinical and physiologic procedures included the Master test, electrocardiograms, circulation time, Rumpl-Leede fragility test, skin-fold caliper measurements, basal metabolic rate, and electromyogram base lines. No significant variations in any of these tests other than the changes in plasma tocopherol and the susceptibility of the erythrocytes to hemolysis by hydrogen peroxide were demonstrated. It was
suggested that variables other than the concentration of alpha-tocopherol in the blood are involved in hemolysis. Erythrocyte hemolysis by hydrogen peroxide has been related to oxidation of the lipid structure of the red blood cell by comparing data obtained from the oxidation of linoleic acid, phospholipids, and brain lipids with oxidations of erythrocyte lipids. Thiobarbituric acid (TBA) had been suggested as a suitable reagent for evaluating the oxidation of biological material in studies of vitamin E deficiency. With this reagent, data have been obtained that show an increased reactivity with biological material from mammals depleted of vitamin E. Correlations between TBA reactivity and the extent of peroxide hemolysis in human erythrocytes were observed.

**MAXWELL**

**PHARMACOLOGY**


Although chronologic age has been shown to be correlated with response to drugs in certain circumstances, such correlation is not inevitable nor is its nature predictable. At times increasing age seems to predispose to hyperreactivity, at times to hyporeactivity, and at times seems not to affect the magnitude of response. The problems involved in establishing and assessing such correlations are discussed. Some points touched upon were computation of drug dosage for a given age on the basis of grams per square meter of body surface, or on the basis of body weight, or square root of body weight; the problem of accounting for possible variation in distribution and metabolism of a given drug for different age groups; variation in the shape of the dose-response curve of a particular drug in a specific age group. It is suggested that the systematic collection of data bearing on these problems may provide leads for important contributions to our understanding of the fate and action of drugs.

**MAXWELL**


Intravenous injection of 100 mg. in 12 normal persons usually caused a decrease of blood pressure, little change in heart rate, decreased stroke and minute volume, and increased peripheral resistance (calculated according to Broemser and Ranke). In 12 persons with cardiovascular disease the blood pressure and the minute volume usually increased, while the peripheral resistance decreased. These changes were often followed by a reaction in the opposite sense.

**LEPESCHKIN**


In persons who had previously received no digitalis, 0.2 mg. of the drug was injected intravenously every 5 minutes, followed by electrocardiographic registration, until a total of 1.8 mg. was reached or signs of toxicity appeared. In persons previously on digitalis, 0.2 mg. was injected every 10 minutes in the same way. In 10 patients with normal hearts no significant changes of S-T or Q-T appeared. In 15 cardiac patients without previous digitalis these changes appeared more readily; up to 1.8 mg. was necessary to cause slowing in atrial fibrillation. Twenty-five cardiac patients treated with digitalis occasionally showed ventricular bigeminy and tachycardia after only 0.2 mg. of acetyl strophanthidin; however, in some cases these did not become more numerous on further injection of the drug. In 6 cases, atrial tachycardia with variable atrioventricular block appeared, and in 2 of these it evolved into atrial fibrillation. When this tachycardia was a result of digitalis intoxication, acetyl strophanthidin caused an increase in atrial rate, complete atrioventricular block with ventricular bigeminy, and sometimes atrial fibrillation. On the contrary, in 3 cases where this tachycardia appeared without previous digitalization, acetyl strophanthidin caused sinus rhythm to appear after 1.2 to 1.8 mg. In 1 case with bilateral broncho-pneumonia with sinus tachycardia and coupled ventricular extrasystoles, 1.2 mg. of the drug caused these to disappear, but after 3 minutes ventricular tachycardia and fibrillation appeared, leading to death. Intravenous infusion of 50 to 75 mEq. of potassium in 20 to 180 min. always caused ectopic rhythms due to digitalis to disappear during or after the infusion; the atrial rate of atrial tachycardia showed a progressive slowing with transition to 1:1 conduction before sinus rhythm appeared. Procaine amide always caused ventricular extrasystoles to disappear in doses less than 500 mg., atrial paroxysmal tachycardia due to digitalis or acetyl strophanthidin (sometimes at rates up to 310) was converted to sinus rhythm as in the case of potassium.
in the majority of the cases, but in 4 cases only slowing of the atrial rate resulted, and in 1 of these 1:1 conduction with marked widening of QRS appeared. Usually a shortening of P-R accompanied the slowing of the tachycardia. Potassium is accordingly preferred in the treatment of atrial arrhythmias, while procaine amide is preferred in that of ventricular arrhythmias because of a more rapid action. In general, acetyl strophantidin is not more toxic than other intravenous digitalis preparations if the intervals between injections exceed 10 min.

LEPESCHKIN


Aminophylline was administered as a suppository to 30 subjects to evaluate the efficiency of this mode of therapy and to determine the best suited suppository bases for this purpose. Plasma levels of theophylline were measured for a period of 1 to 8 hours using the Schack-Waxler ultraviolet spectrophotometric method. The plasma levels obtained after intrarectal administration of aminophylline were checked against blanks obtained from blood obtained before administration. Placebo suppositories were also employed as controls for the observations. The results demonstrated that 2 types of suppositories gave satisfactory blood levels of theophylline. The first of these contained 0.5 Gm. of aminophylline in a mannitol base, with or without benzocaine. The plasma levels of theophylline were over 500 µg per 100 ml. in 8 of 10 tests. The second type of suppository was that in a buffered carbowax base, which produced similar levels in 4 of 6 subjects. Sustained plasma levels of theophylline averaging 650 µg per 100 ml. between the fourth and eighth hours and with the least coefficient of variation were achieved with the mannitol base suppositories. Intravenous aminophylline given to 2 subjects in 0.5 Gm. doses resulted in blood levels approximately 3 times higher than that obtained with the same dose in the suppository form with blood levels well maintained for 2 to 3 hours after injection.

SHUMAN


A reversible cardiac synaptic blockade was induced by succinylcholine in anesthetized cats and in unanesthetized spinal preparations. Succinylcholine is a cholinomimetic agent that acts like acetylcholine to depolarize muscle end-plates prior to blocking neuromuscular transmission. Its blockade of vagal effects resembles the action of nicotine when the latter is given slowly in low concentration. In neither case was a slowing of the heart observed, such as occurs with larger doses of nicotine or with injections of acetylcholine. Therefore, the vagal blockade caused by succinylcholine is ascribed by the authors to depolarizing blockade of transmission from the preganglionic vagus to the intracardiac postganglionic parasympathetic fibers.

WAIFE

Physiology


It has been asserted by other investigators that elevation of left atrial pressure (as in mitral stenosis) causes a greater increase in pulmonary arterial pressure due to pulmonary arteriolar constriction. This mechanism was not demonstrable in the perfused lung of cats. As a matter of fact, a rise in left atrial pressure caused a reduction in pulmonary vascular resistance and an increase in blood volume in the lungs.

SHUMAN


The use of indicator-dilution curves to measure cardiac output and "central blood volume" is time consuming when the curves are markedly prolonged as in heart failure. A new graphic method using semilogarithmic paper is described and its validity is supported by mathematical proof. The advantages of employing this method of calculation include speed and accuracy.

AVIADO


Experiments were made in which the action potentials set up in the rabbit's aortic nerve by electric stimulation were correlated with their reflex depressor effects. In addition to the medullated afferent depressor fibers (A fibers) known to be arising from the aortic baroreceptors, the aortic nerve contains a large group of small nonmedullated afferent fibers (C fibers) with powerful reflex depressor activity. The origin of these C fibers is unknown but the possibility of their participation in reflex effects from the heart and lungs is discussed.

AVIADO

Electric stimulation of the splenic nerves after constriction of the descending coronary artery causes elevation of the blood pressure and heart output, accompanied by decreased flow in the right coronary artery. This decrease in flow is not followed by a compensatory increase and is interpreted as due to a primary decrease in the oxygen consumption of the myocardium, which counteracts anoxia. The flow in the hepatic artery is increased preceding the increase in arterial pressure. The effect on the heart is attributed to liberation of Reni's "hypoxy-linenin" by spleen and liver. After injection into the femoral or hepatic veins of ferritin, levulose, glucose, lactic acid, potassium, adenosine triphosphoric, diphosphoric and monophosphoric acids, serotonin creatine sulfate, and extracts of the spleen and liver, an increase in the coronary flow appeared. It is therefore concluded that none of the above substances can be responsible for the effect of splenic nerve stimulation, since the latter causes decreased coronary flow. Previously it could be shown that epinephrine and norepinephrine also cannot be responsible for this effect.

Lepeschkin


Following a review of Nylin's previous investigations, the authors present a statistical analysis of results of cardiopulmonary function tests obtained in 763 normal persons aged from 15 to 60 years. The following factors were taken into consideration: age, weight, height, body surface, Benedict's standard values, oxygen consumption at rest and after exercise, oxygen debt, cardiac volume per square meter of body surface, and the basal metabolic rate. Mean values were tabulated for men and women and frequency diagrams were reproduced. The correlations between observed and calculated oxygen consumptions are discussed. The former correlated well with heart volume but not with age. No relation could be established between oxygen debts and age, length, weight, body surface, basal metabolic rate, or heart volume. Possible errors influencing the statistical evaluation are discussed. Nomograms of correlations between exercise and resting oxygen consumption for practical use are presented.

Pick


In 84 patients aged 28 to 89 years, without symptoms or signs of cardiovascular disease, the duration of the ventricular ejection phase ("isotonic systole") was determined and correlated with the ventricular rate, the stroke output, blood pressure, peripheral resistance, and elasticity of the arteries. The respective data were determined from simultaneous recordings of carotid and femoral pulses by Frank's (air transmission) sphygmograph. The stroke output was calculated according to Weizler and Boger and as a measure of arterial elasticity the velocity of the pulse wave was taken into consideration. The data were analyzed statistically and respective regression formulas were presented. The conclusion was reached that in normal individuals, regardless of age, the duration of the ventricular ejection phase depended at rest on the heart rate and stroke output and was unaffected by variations of the blood pressure, by the peripheral resistance, and by elasticity of the arteries as occurred with advancing age. A nomogram was presented that may be useful in the evaluation of alterations of the ejection phase under abnormal conditions.

Pick


Both mesenteric and hepatic arteries were observed to have decreased blood flows during hemorrhagic shock. Resistance increased in the hepatic artery. At the latter end of a period of low blood pressure, mesenteric arterial resistance often decreased at the same time during which there was an elevation in venous portal pressure. Hepatic arterial resistance continued to increase during this same late hypotensive period. Transfusion increased mesenteric blood flow. These values were often above the original control values. At the same time portal pressures increased 2 fold while mesenteric resistance decreased. It is suggested that this phase may represent mesenteric pooling in capillaries and venules depending on reduced inflow and increased outflow resistance. Later mesenteric resistance increased up until the agonal period. There was sometimes a terminal decrease. Hepatic artery flow increased gradually after transfusion. The maximum was at 90 minutes. At this time mesenteric artery flow was very much reduced with an extremely high resistance.

Oppenheimer


At rates up to 300 beats per minute there was a significant correlation with coronary flow and cardiac oxygen use. The role of rate in the determination of cardiac oxygen utilization is stressed. When rates were excessive or the load was very great the relationship of coronary flow to oxygen consumption was shifted. Under these conditions energy metabo-
ABSTRACTS

951

RENAI AND ELECTROLYTE EFFECTS ON THE CIRCULATION


The effects of motionless standing on electrolyte metabolism were determined in normal young men. When isotonic sodium sulfate was infused, there was an abrupt decrease in renal excretion of sodium and chloride, but little change in urine flow or sulfate excretion. There was also an increase in potassium and ammonium excretion, and a fall in urinary pH. Administration of Diamox, prior to quiet standing, prevented the increased potassium excretion. Thiomerin also blocked the increase in potassium excretion, but did not prevent the formation of a more acid urine and an increase in ammonium excretion. These results demonstrate that changing from the supine to the standing posture provides a specific stimulus to the renal tubular reabsorption of sodium. The data are compatible with the theory that the renal retention of sodium so produced, is caused in part by an increased reabsorption of sodium from urine through ionic exchange with the tubular cells for potassium and hydrogen ions.

WAIFE


A transient hyperkalemia was induced by hyperventilation in normal subjects when acute respiratory alkalosis was reached. Early in respiratory alkalosis, potassium was added to the circulating blood from the splanchic region, and was removed from the blood in the brain and peripheral tissue. Later the serum potassium concentration fell below resting levels as potassium moved from an extracellular to an intracellular position.

WAIFE


In patients with constrictive pericarditis, estrogen administration was associated with marked and sustained retention of water, sodium, and chloride. Similar though less striking effects were noted in patients with congestive heart failure. In normal subjects slight and transient effects only were observed.

However, in patients with the nephrotic syndrome, significant retention of salt and water was not found. This would suggest that the kidney plays no primary role in such retention. The only factor common to all groups in which fluid retention after estrogen

ism of the heart changed so that less oxygen was extracted from blood even though it was more available. Anaerobic activity of the heart may therefore have a definite role for periods that are long enough to exclude ordinary oxygen debt.

Oppenheimer


Rats were allowed to swim for \( \frac{1}{2} \) hour daily up to 5 to 8 weeks. Exercised rats did not gain as much weight as controls. Adrenal glands and ventricular weights were increased in the exercised animals. There was no change in skeletal muscles in these same rats. The relative total succinic dehydrogenase activity was significantly increased in heart ventricle but not in gastrocnemius. Unit and actual total activities were not changed in either skeletal or heart muscle.

Oppenheimer


Under anesthesia vagotomized dogs, whether or not carotid sinuses were denervated, responded to intravenous ephedrine in a manner similar to control animals. Low cervical section of the cord, however, was attended by a 3-fold increase in response to epinephrine under anesthesia. When vagotomy was added, the response was still greater. If cord section was made 1 or 2 segments below C4 to T1, the epinephrine response was reduced. Anesthetized spinal dogs (C5 to T3) were more responsive to epinephrine than similar unanesthetized animals.

Oppenheimer


The intracardiac transport of human serum albumin labeled by \( I^{31} \) was determined with the help of a scintillation counter directed toward the precordium. Fluctuations of the intracardiac radioactivity were registered as a function of time in the form of 2 successive and partly superimposed concentration curves. The curves were produced by the right and left heart respectively and permitted measurement of the mean circulation time of the tracer substances through the lungs. The method was useful in determination of the circulating lung blood volume, since it eliminated extrapulmonary factors involved in conventional dye-dilution techniques. The technic of the method is described in detail, and the significance of the measurable mean lung circulation time is discussed.

PICK

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occurred, and absent from groups in which retention did not occur, was hepatic involvement. Strong support is provided for the hypothesis that differing degrees of hepatic circulatory impairment lead to differing rates of estrogen inactivation and may be responsible for the marked fluid retention after estrogens in cirrhosis with ascites in contrast to the slight retention in cirrhosis without ascites.


Distribution volumes of mannitol, sucrose, thiosulfate, and radiosulfate were unchanged in extracellular fluid 6 hours after removal of both kidneys.


Atrophic changes in the zona reticularis and fasciculata of the adrenal cortex were produced by Rhothane. ACTH increased the glomerular filtration rate and the effective renal plasma flow, but decreased the filtration fraction. Rhothane decreased renal function in 60 per cent of the dogs and ACTH restored all parameters except the filtration fraction. If Rhothane and ACTH were administered at the same time a progressive decrease in function resulted in animals with elevated levels (3 out of 5 dogs).


Data were reported dealing with the relations of urinary flow, osmolarity, and load in patients with ketoacidosis. Observations made on 19 subjects with diabetic acidosis revealed no correlation between urinary total osmolarity and flow and the fact that osmotic activity is minimally diminished in the uncomplicated case. Granting that the data were few, they suggested some diminution of distal tubular water reabsorption in acidosis. It appeared that uncomplicated moderate ketoacidosis caused only minimal impairment of concentrating ability. It was suggested that factors such as potassium deficiency or renal ischemia may alter tubular function. However, from the data reported it was apparent that the concentrating ability of the kidney was appreciably decreased only when hypotension or other complication was present. The flow is closely related to the total load and to glucose load as well, since glucose comprises the largest and a relatively constant fraction (40 per cent) of the load.

Maxwell

ROENTGENOLOGY


In this as in previous articles the authors report on their investigations of the blood-brain barriers, to indicate the roles played by concentration of the opacifying media, and the importance of the injection pressure. In this study a 35 per cent solution of Unbradil was injected into the carotid artery (rabbits), under conditions varying in amount, time, and recorded pressures, and the resultant effects on brain tissue were assayed. While the duration of injection and the pressures employed by themselves were not determining factors in producing brain damage the cumulative effects of both these factors combined led to significant brain injury.

The authors conclude that in clinical cerebral angiography the injection pressure probably plays only a minor role unless on theoretic grounds it is performed in patients with arterial hypertension, when undesirable effects might result.

Schwedel


Percutaneous splenoportography is a safe and diagnostically valuable procedure, as evidenced by the series of cases presented in this paper. The chief usefulness of the method rests with its ability to offer the following information: (1) confirmation of the existence of portal hypertension, (2) localization of the site of obstruction, and (3) demonstration of anomalies of the portal system. The authors believe that with increasing application of this procedure more complete understanding of the portal circulation will be possible.

The contraindications for splenoportography are pronounced tendency to hemorrhage, infectious splenomegaly, and the presence of ascites, which must be aspired prior to attempting visualization.

Bernstein


Angiocardiograms in 75 patients with verified left-to-right shunts were reviewed. Patients with patent ductus arteriosus showed nonopacified filling defects demonstrable either at the venous
end of the ductus or extending proximally almost to the pulmonary valve. These occurred almost always in ventricular diastole, less frequently in systole. In patients with ventricular septal defects mixing defects, large or small, oftener in systole than diastole were demonstrated in 7 of 18 cases. With atrial septal defect findings were diagnostic only within sharply margined right atria in 3 of 13 cases. There was 1 demonstrable instance of total pulmonary venous drainage into a left superior vena cava draining into a left innominate vein and another with indentation of the lateral margin of the superior vena cava by a right anomalously draining pulmonary vein.

Schwedel


In rabbits a deep cassette containing 6 films 8 mm. apart is swung manually during injection of radiopaque dye. In order to compensate for the different intensity of the x-rays falling on each film, the more distant films have stronger intensifier screens and are developed longer. The 6 roentgenologic cross-sections of the heart obtained by this method allow recognition of the cardiac cavities, great vessels, and valves with much greater clarity than conventional angiocardiography. Technical improvements will allow the reduction of the swing time to less than 0.1 second and its synchronization with the electrocardiogram, so that systolic and diastolic tomograms can be obtained.

Lepeschkin

SURGERY AND CARDIOVASCULAR DISEASE


Recent surgical literature indicates an increasing acceptance of the direct surgical treatment of obstructive arteriosclerosis. The removal of the obstruction and the reestablishment of the vascular channel by resection and replacement by a suitable vascular graft, or by thromboendarterectomy have both been successful. A case of obstructive arteriosclerosis of the right common iliac artery treated by thromboendarterectomy is reported. Maximum benefit was obtained and this benefit has been maintained over a period of 3 years, suggesting that the vessel will remain patent for the duration of the patient's life and that this area will be the least involved by future arteriosclerotic changes in his total vascular system. Selection of patients with localized or segmental arteriosclerosis and well-developed collateral circulation would seem to be the greatest factor in obtaining a maximum result by thromboendarterectomy.

Kitchell


The authors described their experiences in the surgical closure of a patent ductus arteriosus in a series of 110 operations, performed on patients ranging in age from 7 months to 42 years. In 91 patients the ductus was divided between Potts ductus clamps. In every patient 1 or more antibiotics were given. All patients survived. The authors did not think that division of the ductus was more hazardous than ligation. They pointed out that for the best results in the treatment of this condition, the surgeon, pediatric or medical cardiologist, anesthetist, and radiologist must work together as a team.

Abramson


After attempting various procedures for the correction of transposition of the aorta and pulmonary artery, the author found most satisfactory the technique of utilizing a homologous aortic graft to transpose the inferior vena cava and the right pulmonary veins. This approach was applied successfully in 1 patient.

The operation consisted of dissecting the right pulmonary veins, and the inferior vena cava free and applying a curved coarctation clamp on the latter vessel so that blood flow through it into the right atrium was not occluded. An incision was made in the portion of inferior vena cava held within the coarctation clamp and one end of the aortic graft was anastomosed to the edges of the incision. The open end of the graft was sutured to the lateral wall of the right atrium. Finally, the attachment of the inferior vena cava to the right atrium was divided, causing blood to flow from the inferior vena cava through the aortic graft and into the left atrium. With such a procedure, blood from the inferior vena cava empties into the pulmonary circulation via the left atrium, while blood from the right pulmonary veins reaches the systemic circulation by way of the right atrium.

Abramson


Temporary ligation of the inferior vena cava was
performed in 55 dogs using absorbable gut. The subsequent course was studied using venograms and autopsy examination. In 10 of the animals Tromexan was administered before operation and continued postoperatively.

Twenty-seven dogs survived for over 10 days. Twenty-three showed x-ray and autopsy deligation and luminal reconstitution of the cava. In the series as a whole the use of absorbable gut resulted in a high percentage of later deligation and recanalization of the venous lumen. It was found that extensive distal venous thrombosis could be prevented by early postoperative use of Tromexan.

Saphenous venous pressure was high immediately after operation but it dropped and leveled off at an elevated point 1 hour later. With the reestablishment of the circulation through the inferior vena cava, the pressure gradually decreased.

**ABRAMSON**


The author evaluated the effects of mitral commissurotomy on a series of 50 patients observed for 5 to 61⁄2 years after operation. In 20 there was a definite history of rheumatic infection, while in every instance there was some degree of cardiorespiratory functional incapacity. Twenty-seven patients had experienced 1 or more bouts of congestive failure, 23 gave a history of gross hemoptysis, and 6 had had arterial emboli from which they recovered with some residual damage.

Three patients died within the first postoperative month. The cause of death was the production of too much valvular insufficiency in 2 and surgical shock in the third. An additional 6 patients had died within a 3-year period. Forty-one patients were living approximately 5 years or more after surgery.

The author pointed out that if one were to judge the present clinical status of patients with commissurotomy on the basis of their murmurs alone, it would be impossible to reach any definitive conclusion. However, he believes that, as assayed both subjectively and objectively, the operation has been of value to the majority of patients so treated. Furthermore, the degree of improvement obtained at the end of the first postoperative year has been maintained over a 5-year period.

**ABRAMSON**


The authors presented the results of surgical treatment, using hypothermia and direct vision repair, in 2 unusual congenital cardiac anomalies.

In both cases there was an abnormal joining of the pulmonary veins and the atria. One was a triatrial heart, and the other, total anomalous pulmonary venous drainage with entry of all the pulmonary veins into the right atrium. In the latter instance, the only blood received by the left atrium was that which flowed through the patent foramen ovale.

In the patient with the triatrial heart the left atrium was divided by a septum into 2 chambers—a posterior-superior cavity into which all of the pulmonary veins entered, and an anterior-inferior cavity which led into the left ventricle through a normal mitral valve. The third atrial chamber was opened while a finger in the left atrium invaginated the abnormal septum into the third chamber, and then the septum was divided under direct vision.

In the patient with total anomalous pulmonary venous drainage, the right atrium was opened under direct vision, the atrial septal defect was enlarged and then the right atrium was reconstructed. The 4 pulmonary veins were directed through the atrial septal defect into the left atrium.

**ABRAMSON**


The authors studied 32 patients with traumatic arteriovenous fistulas who had been treated with quadruple ligation and excision of the lesion. Good follow-up data were available on 24 of these subjects. Of this number 4 had involvement of an upper limb and 20 of a lower limb. Of the latter, 10 had residual arterial insufficiency while the remainder demonstrated an adequate circulation. In all 4 patients with upper extremity lesions there was some impaired use of the involved arm. In most of the cases in the group, symptoms of venous insufficiency existed.

The authors concluded that, when possible, the surgeon should attempt to reestablish arterial and venous continuity in the lower limb when treating traumatic arteriovenous fistula. If this cannot be done, satisfactory results may be obtained in most instances with quadruple ligation and excision.

**ABRAMSON**


The previous literature on this subject is reviewed by the author, who finds the reported incidence of electrocardiographic abnormalities in infectious mononucleosis to vary from 5 to 50 per cent. The present study concerns the clinical and electrocardiographic findings in 100 consecutive hospital patients with mononucleosis. Electrocardiograms of 5 of the 100 patients revealed abnormalities. The changes consisted of prolongation of the P-R interval, complete atrioventricular heart block,
prolonged Q-T interval, and flattened T wave in lead II. The high incidence of electrocardiographic abnormalities reported elsewhere may be related to an incorrect diagnosis of mononucleosis or to interpretation of the electrocardiograms in which the so-called “changes” were within normal limits. In this report, mononucleosis was thought to be established on the basis of hematologic and serologic data. The findings indicate that myocarditis is not a clinically recognizable feature of mononucleosis.

SHUMAN


A rare case of bronchogenic carcinoma with invasion of the median pulmonary vein and a pendunculated extension into the left atrium and ventricle is presented. There were no other sites of metastases. The authors discuss the varied histology at different areas in the tumor mass with relation to our present histologic classification of bronchogenic carcinoma.

MAXWELL


Typical symptoms of mitral stenosis (including accentuation of the first heart sound) were present in a man who died in pulmonary edema and in whom an apple-sized myxoma of the left atrium was found at autopsy. The myxoma was attached to the posterior wall of the atrium while the mitral valves were completely normal. The patient had previously reported sudden episodes of unconsciousness during work.

LEPESCHKIN

VASCULAR DISEASE


The author describes 2 patients with pericardial effusion apparently due to involvement of the pericardium in scleroderma. The pericarditis associated with scleroderma may have a protracted course and may not significantly contribute to disability over long periods of time. The fluid in both patients was similar, characterized by high protein, low cell count, absence of blood, and negative culture. In 1 patient the electrophoretic patterns of the heparinized pericardial fluid and of the plasma were virtually identical.

HARRIS


A case of prolonged shock associated with a dissecting aneurysm of the aorta is described. The shock responded to therapy with levaterenol (Levophed) until death resulted from rupture of the aneurysm into the pericardial sac, with resultant cardiac tamponade. P-wave changes described in atrial infarction were found in the electrocardiogram.

This case further demonstrates that the electrocardiographic findings may also be misleading. While there were no changes typical of myocardial infarction, the rapidly changing pattern would be consistent with this diagnosis. The P-wave changes seen in the first electrocardiogram, suggesting atrial infarction, may actually have been due to the diffuse subendocardial hemorrhage of the right atrium found after death. Electrolyte disturbances associated with azotemia, particularly hyperpotassemia, undoubtedly contributed to the changes seen in the last 2 electrocardiograms.

BERNSTEIN


The authors studied a group of 341 patients who underwent 510 surgical procedures for recurrent varicose veins. All previous operations had consisted of ligation followed by sclerosing therapy, except in 2 patients, who had undergone incomplete stripping procedures. In about 80 per cent of patients further surgery was performed within 10 years after the original ligation. Outstanding characteristics of recurrent varicose veins were: incompetence of superficial and perforator veins in thigh, leg, and foot, and inadequacy of ligation at the saphenofemoral or saphenopopliteal junctures.

The authors stress the importance of correctly diagnosing the presence and location of incompetent veins prior to operation, so that all of them can be adequately treated surgically, and of proper ligation of vessels at the saphenofemoral or saphenopopliteal junctures. They indicate that eradication of all incompetent veins is the most effective preventive measure against recurrence.

ABRAMSON
ABSTRACTS

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