ABSTRACTS
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BALLISTOCARDIOGRAPHY

The authors studied, in 35 cases of pulmonary tuberculosis, the effect of pneumothorax, pneumoperitoneum, phrenicectomy and their combinations upon the ballistocardiogram (electromagnetic method according to Dock).

Unilateral pneumothorax, right or left, only rarely caused alterations of the ballistocardiogram. Following bilateral simultaneous pneumothorax, or the other two procedures employed, the amplitude of the ballistocardiogram became smaller affecting equally all deflections, and failed to vary with respiratory movements. These alterations of ballistic forces can be ascribed to the interposition of air, a diminution of ejection time of the right ventricle, and augmentation of resistance to the output of the right ventricle and alterations in the equilibrium of the output of the two ventricles in the course of the respiratory cycle.

Pick


At the present time, three types of the ballistocardiograph are in common use: (1) the Starr high frequency undamped bed, (2) the low frequency critically damped bed of Nickerson, and (3) the direct body pick-up, proposed and popularized by Dock. Thus far, the ballistocardiogram has made little contribution to knowledge of valvular heart disease or of congenital heart disease, with the exception of coarctation of the aorta, in which a reasonably definite pattern is frequently found. Clinically normal subjects may have abnormal records and patients with coronary disease may have normal ones, and one can only speculate upon the meaning of these data. The only test that we have encountered that impressively differentiates between normals and patients with coronary artery disease is one based on the effect of cigarette smoking. Similar ballistocardiographic deterioration followed the sublingual administration of nicotine. Analyses show that the mechanical systems inherent in the Starr high frequency technic, in the Nickerson low frequency technic, and in the direct body pick-up procedures, are all subject to disadvantages bound to lead to distortion and inaccuracy. All of these methods suffer from the fact that the body-platform contacts create oscillations of the body which do not have cardiovascular meaning. These oscillations occur at frequencies which fall in the midst of the ballistocardiographic range and consequently seriously distort the records in both timing and amplitude. It is hoped these follow-ups will reveal that the coronary artery circulations of normal controls with normal ballistocardiograms remain efficient longer than those of controls with abnormal records. Statistically significant figures to make these hopes facts will not be available until such long-term studies, utilizing the conventional and the newer aperiodic ballistocardiographic technics, are completed. The ideal line of progress should connect definitively the physiologic events in the cardiovascular generator with the component waves of as faithful a force ballistocardiogram as can be recorded. When this ideal is attained, then ballistocardiography will provide not only information upon the clinical cardiovascular efficiency not obtainable by other means but also information which is deeply needed by the clinician to guide him both in his therapy and in his predictions of the outcome of his patient's ills.

Wendkos

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ENDOCRINE EFFECTS ON CIRCULATION


Five adult subjects, three of whom were well controlled epileptics, were each given an intravenous infusion of either 50 mg. or 100 mg. of hydrocortisone in 5 per cent glucose and 1 per cent ethyl alcohol over a period of four hours. Two normal adult males served as controls, receiving only 5 per cent glucose and 1 per cent ethyl alcohol infusion during the four hour period. Samples of blood and urine were taken for study just before the infusion was begun, at 2 hours and at 4 hours after the start of the infusion. No further samples were taken after the infusion of hydrocortisone was stopped.

All of the subjects receiving hydrocortisone showed a progressive drop in the eosinophil count over the four hour period. The levels of serum sodium and serum chloride showed inconsistent changes over the four hour period, as did the excretion of these two ions in the urine. However, there was a marked increase in the excretion of potassium in the urine of all the experimental subjects, and four out of five subjects showed an increase in serum potassium level equal to from 0.6 to 1.1 mEq. The controls showed no significant change in serum potassium or potassium excretion. The simultaneous increase in serum potassium level and urinary potassium excretion suggests an effect of hydrocortisone not only on the renal tubules but also on the ion exchanges which take place across the cell membrane, releasing potassium from body cells faster that the kidney can excrete it. Other investigators have demonstrated that the administration of hydrocortisone for longer periods of time results in a drop in the serum potassium level below normal.


The authors report results of cortisone and corticotropin treatment in 267 cases with acute rheumatic fever, observed over a period of at least one month. Cortisone was used in the majority of the instances while corticotropin was applied in urgent cases by intravenous drip. The indications for the use of hormonal therapy and the dosage are outlined, the incidents accompanying the treatment described and the necessity pointed out to keep such patients under close observation.

Hormone therapy is at present the most active therapeutic procedure in acute rheumatic fever. Its success in certain fulminant types of the disease is unquestionable. In the common variety the use of cortisone seems to diminish the number of complications, in particular the incidence and the evolution of cardiac lesions. The conclusion of the authors is that in every attack of rheumatic fever, even when occurring in a mild and apparently benign form, early employment of hormonal therapy is indicated.

HYPERTENSION


A case is reported illustrating the truism that hypertension in infancy is always secondary rather than primary. A male infant of nine months of age was investigated for hypertension of fair degree (240/180 mm. Hg). The report gives (approaches to the problem), the various studies done and the final elucidation, when a renal arteriogram was performed. It was found that the infant had an anomalous arterial supply to the right kidney with a double renal artery and numerous aneurysmal dilatations present within the kidney parenchyma. Right nephrectomy was performed. There was marked ischemia of most of the kidney parenchyma and thrombosis in some of the branches of the renal artery. There was a prompt fall in the blood pressure to normal levels. A two year follow-up shows a younger with normal growth and development and normal blood pressure.


Twenty male patients with essential hypertension were studied for the effects of 60-degree head-up passive tilting on renal function. An additional seven patients with essential hypertension were studied for the effects of ambulation. In both groups, glomerular filtration rate (GFR), renal plasma flow (RPF), maximum tubular excretory capacity (TmPAH), blood pressure, and the rates of excretion of water, sodium, and potassium were observed.

Mean blood pressure fell 10 per cent in the tilted position. There were even greater declines in values for glomerular filtration rate, renal plasma flow and renal blood flow, the latter indicating an increase in renal vascular resistance. The reductions in glomerular filtration rate and renal plasma flow were parallel. Maximum tubular function (maximum tubular excretory capacity) was also significantly depressed, indicating a reduction in the number of functioning nephrons. The decrease in glomerular filtration rate:maximum tubular excretory capacity ratio, however, demonstrated that
the decline in the number of nephrons was exceeded by the decrease in filtration rate since the latter was more sensitive to changes in hemodynamics. The rates of water and sodium excretion were depressed more than any other process studied. Potassium excretion was only slightly depressed. The reduction in water and sodium excretion during tilting was out of proportion to the fall in glomerular filtration rate, renal plasma flow or tubular excretory capacity, suggesting that there may be factors other than vasoconstriction in operation, possibly neurogenic effects on tubular resorption of sodium and water.

In contrast to the response in the passively tilted position, ambulation resulted in no change in mean blood pressure. However, glomerular filtration rate, renal plasma flow, and maximum tubular excretory capacity were depressed, indicating renal vasoconstriction, but this was not nearly as marked as in the tilting experiments. The response on electrolyte and water excretion to ambulation was also qualitatively similar to the response to passive tilt, but again was not so marked.

There was no significant difference in the reactivity of the severely damaged kidney as compared to the normal ones, and the changes in this series of hypertensive patients closely resembled those seen in normotensive patients. This suggests that the nephrons that remain functional react in a relatively normal manner.

CORTELL


Seventeen patients with essential hypertension but not in cardiac failure received 1-hydrazinophthalazine through a catheter with the pulmonary artery. Twelve subjects experienced minor discomforts. In these persons there was a decrease in vascular resistance in the systemic circulation (−31 per cent) and in the lung (−28 per cent). There was also a fall in systemic arterial pressure and a rise of 33 per cent in cardiac output. However, the calculated left ventricular pressure work was not increased in spite of the increased cardiac output.

The other five subjects experienced a marked fall in blood pressure, pallor, diaphoresis and apprehension; and oxygen had to be administered by mask. In these subjects there was no change in cardiac output. Probably the marked hypotensive effect was due to failure of venous return because of peripheral and splanchnic pooling of blood. This group showed a fall in left ventricular work. Hyperventilation was noted in 14 of the 17 patients.

WAIFE


The hypotensive activities and side effects of 3 isomers of Dibozane were examined by means of intravenous infusions of the drugs to a total of 10 hypertensive patients. Observations were made on the blood pressure, pulse rate, electrocardiogram and individual reactions during the infusion. The dextro isomer (80 to 100 mg. in 22 to 45 minutes) produced no significant hypotensive or side effects. The levo isomer (42 to 100 mg. in 17 to 56 minutes) produced significant hypotensive effects in 5 of 10 patients. The side effects observed with this compound included cardiac arrhythmias such as premature contractions of nodal and auricular origins, sinus tachycardia and wandering pacemaker. Other effects included drowsiness, nausea and vomiting, restlessness, and urinary or defecatory urgency. The meso isomer (65 to 100 mg. in 17 to 54 minutes) produced a hypotensive effect in 3 of 10 patients. In addition to the above side effects, certain patients experienced impairment of thinking and recall, and disorientation. The levo isomer was the most potent vasodepressor agent but its therapeutic usefulness is limited by the side effects which may accompany its use.

SHUMAN


Five cases of mental depression in hypertensive individuals are reported. Each patient had received reserpine in doses of 1.0 to 2.0 mg. daily, with the exception of one, who received a dose of 0.25 mg. per day. Some patients also received veratrum alkaloids and others received pentolinium bitartrate with or without 1-hydrazinophthalazine, but Reserpine was the only drug given to all of the patients. The depression cleared in all but one of the patients soon after the reserpine was discontinued. All patients exhibited withdrawal, lethargy and unhappiness. There was no anorexia or weight loss. Two of the patients contemplated suicide. Lesser manifestations of depression observed in other patients have included lack of ambition, crying spells, introspection and lethargy. In every case of the series reported, the reserpine had been given for two months or longer before symptoms of depression appeared. Once the depression developed, simple reduction of dosage failed to relieve the symptoms and it became necessary to stop the drug completely. The author suggests that maintenance doses of reserpine be kept as low as possible, preferably be-
low 0.25 mg. daily, to reduce the likelihood of the development of this syndrome.

Rosenbaum

PATHOLOGIC PHYSIOLOGY


In order to establish whether mitral regurgitation is typically reflected in the contour of the pulmonary arterial wedge pressure curve, the authors reviewed their material consisting of 30 curves obtained in catheterized patients with a normal mitral valve (hypertension, pericarditis and patent ductus arteriosus) and 180 curves in cases with mitral disease, including instances with pure mitral stenosis as well as cases of mitral stenosis associated with moderate or severe grades of regurgitation. Forty-five cases of the mitral group were submitted to commissurotomy.

In some cases with predominant mitral insufficiency a high “systolic” pressure peak was recorded in the P.V.C. curve. However, in other cases with the same degree of regurgitation the “systolic” pressure wave was equal or lower than the presystolic wave. On the other hand, in cases with pure mitral stenosis (two confirmed at surgery), the “systolic” wave was early and higher than the presystolic wave. In 12 cases with mitral regurgitation verified surgically, the P.V.C. pulse presented a normal contour with one exception in which the amplitude of the v wave was marked. These observations led the authors to the conclusion that the contour of the pulmonary arterial wedge pressure curve provides no information concerning the presence or absence of mitral insufficiency.

Pick


The author studied 130 hearts of premature, newborns and infants by anatomical, histologic and planimetric methods. On the basis of this study and a comparative study in 142 hearts of cats he arrived at the following conclusions. In the last months of pregnancy the musculature of the right ventricle grows more than that of the left ventricle so that in babies born at term the right ventricle weighs more than the left. In the subsequent weeks, however, this difference decreases, first rapidly then slowly. Since this is due to reduction of the weight of the heart and of the size of myocardial fibers of the right ventricles, it represents a physiologic postnatal atrophy of this chamber. In the premature this could be demonstrated at the end of the first week of life. The growth of the left ventricle is rapid and out of proportion to the increase of body weight. Abnormal left ventricular hypertrophy develops in the infant much faster than in the adult.

These anatomic findings suggest the following physiologic processes in the neonatal period. In the last month of pregnancy the output of the right ventricle increases more than that of the left due to augmentation of blood flow through the embryonic lungs. Reduction of pressure in the pulmonary circulation starts soon after birth, probably in the first stage of life. Histologic studies of the closed ductus arteriosus in the cat suggests that the pressure gradient between systemic and pulmonary circulation, developing soon after birth, does not prevent the spontaneous closure of the ductus.

Pick


The authors reviewed their material of pulmonary arterial wedge pressure curves obtained in 55 cases of pure mitral stenosis (35 proven at surgery) and 24 cases with mitral insufficiency (10 proven at surgery), the purpose being to determine the validity of the method in differentiating the two conditions.

The characteristic alteration of the wedge pressure curve in mitral stenosis is augmentation of its presystolic portion; it was found only in about half of the respective cases and was absent in auricular fibrillation. The tent-like deflection, considered characteristic of mitral regurgitation was absent in about half of the proven cases and found in several instances in whom stenosis without significant insufficiency was encountered at surgery. It is concluded that the pulmonary wedge pressure curve is of limited value in the differential diagnosis of mitral stenosis and insufficiency, and this only as long as sinus rhythm is present. Noncharacteristic alterations of presystolic and systolic portions of the curves, which were found in about half of the cases, do not permit the exclusion of one or the other condition.

Pick


Mercuphylline caused an almost complete inhibition of succinic dehydrogenase in the thick portions of Henle’s loops. Activity of the proximal convoluted tubule was reduced, while activity was only slightly reduced in the distal tubule.
Mercuhydrin in the same doses produced a very marked inhibition of succinic dehydrogenase in the proximal tubule, whereas the distal tubule and the thick portion of Henle's loops were scarcely affected.

The amounts of mercury and theophylline were the same for both diuretics. It would seem, therefore, that the different organic components of these drugs are responsible for the differences in enzymatic inhibition.

**Waife**


Over 100 cases of acute hypernatremia seen over a period of four years are discussed. With few exceptions these cases all seem to fall into three categories, which the authors have designated as primary dehydration, central nervous system injury, and diabetic coma after saline therapy. Hypernatremia may result if patients in diabetic coma are treated solely with insulin and saline solutions. The treatment of hypernatremia is the intravenous or oral administration of non-saline fluids. Such treatment is usually successful except in cases of central nervous system injury severe enough to produce death.

**Bernstein**


The subjects of this study were found to be in peripheral circulatory failure due to a variety of conditions. Cerebral blood flow, oxygen consumption, vascular resistance and direct arterial blood pressures were determined in each prior to the administration of vasopressor drugs. The mean arterial pressure in the 11 patients was 51 mm. of Hg with a range of 20 to 76 mm. The mean value for cerebral blood flow was reduced to 31.5 cc. per 100 Gm. of brain per minute. There was no apparent correlation between the rate of blood flow and the state of consciousness. The mean value for cerebral metabolic rate was 1.9 cc. and varied from normal to markedly reduced levels. Oxygen extraction, in some cases, was markedly increased; in others, it was reduced. It appears that there are compensatory mechanisms which maintain cerebral metabolism despite a reduction of arterial pressure and cerebral blood flow. In some instances, a decrease in metabolism and oxygen extraction was observed which may result from a failure of the compensatory mechanisms. It is concluded that alterations in cerebral hemodynamics play an important role in the prognosis of shock.

**Shuman**


Studies of pulmonary “capillary” pressure or pulmonary artery wedge pressure and pulmonary artery–pulmonary “capillary” pressure gradient are reported in 150 patients with cardiopulmonary disease, including the effects of acute stress in certain patients. Sixteen of 28 patients with chronic pulmonary disease, five patients with congenital heart disease, and three cases of primary pulmonary hypertension had precapillary pulmonary hypertension and an elevated PAm-PCm gradient. Postcapillary pulmonary hypertension occurred in forty-one of 45 cases of predominant mitral stenosis with elevation of the APm-PCm gradient in two-thirds and with correlation, in general, between the magnitude of the PCm and the PAm-PCm gradient. Postcapillary pulmonary hypertension was observed in 7 of 8 patients after mitral valvuloplasty and in various other examples of impaired left heart flow.

Most cases of congenital heart disease, tricuspid and aortic valve disease, hypertension without failure, and twelve of 28 patients with chronic pulmonary disease had a normal PAm and PCm.

Maximal cough caused a sharp rise in PAm and PCm, the latter more marked with chronic pulmonary disease and mitral stenosis. The Valsalva maneuver usually caused a rise in PAm greater than that of PCm. Exercise caused a rise in PAm and little change in PCm in patients with precapillary pulmonary hypertension. In the postcapillary type both PAm and PCm rose significantly with exercise. Acute hypoxia elevated the PAm in unoperated patients with mitral stenosis and elevated the PCm in two of three patients. With chronic pulmonary disease hypoxia elevated the PAm without effect on the PCm.

**Rinzler**


It has been shown that effective antibiotic therapy prolongs the life of dogs subjected to prolonged hemorrhagic hypotension. To be effective, administration of these agents must precede a few hours the onset of shock. If the stage is reached where transfusion does not restore the circulation, then antibiotics no longer confer protection. Antibiotics may be given either by mouth or by vein and still be effective. This suggests that the bacteria which produced irreversibility to transfusion are to be found in tissues. Although bacteria from the lumen of intestine may invade during shock, they are a dispensable factor. Clostridia are found in dog tissues.
during life although the blood is usually sterile. Immediately after death, clostridia are found in blood and tissues. In many cases intestinal aerobes are also present. The last mentioned probably invade in the normal dog too, but are rapidly cleared from the blood. It seems that aerobes are easily destroyed while clostridia are not. Correlation between any specific type of bacteremia and any one antibiotic was not very close.

Oppenheimer


Colloidal radioactive gold, Au 198, in doses of 50 to 100 cc. was injected intravenously into 25 normal controls and 12 patients with hepatic cirrhosis without edema. From the disappearance rate it has been possible to calculate the minimal fraction of the total blood volume perfusing the liver per minute.

By this method the average minimal hepatic blood flow in the controls was 1425 ml. per minute in men and 1010 ml. per minute in women. These values correspond satisfactorily with the results obtained by other methods. In cirrhosis, the disappearance rate was greatly diminished. There is evidence that the disappearance rate is to a large extent related to the hepatic circulation. Calculations of liver blood flow by this method show a reduction from 19 ml. per Kg. in normals to 8 ml. per Kg. in cirrhotics.

Waife


The authors studied in a material of 90 angiocardiographies the function of the right atrium—venae cavae system under normal and pathologic conditions. The technic consisted in roentgenkine-matographic recordings of intravenous injection of 1 to 2 cc. per Kg. of 70 to 80 per cent contrast material, with 18 to 24 pictures taken per second.

Reflex into the superior vena cava was seen in normals. It represents a normal mechanism of pressure adaptation and has no pathologic significance. Reflux into the system of the inferior vena cava, on the other hand, both systolic and diastolic, occurs only under pathologic conditions with right ventricular overload, in particular in septal defects, and in outflow obstructions, most frequently in Fallot's tetralogy. On the basis of the material examined it was concluded that it indicates the presence of right heart failure. Additional signs of right heart failure manifested in angiocardiograms were irregularities in the contour of the atrial shadow occurring during atrial systole and signs of insufficiency of mechanisms causing closure of the ostium of the superior vena cava.

Pick


The dye-injection method of Hamilton, using Evans blue dye (0.5 per cent solution) for the determination of cardiac output, was employed in 24 normal subjects at rest, in nine of these during exercise. A bicycle ergometer pedalled at 50 rotations per minute was employed for exercise in recumbency. Free arterial flow was used to secure blood samples. The dye-injection method of estimating cardiac output yielded reproducible results in the subjects studied at rest. Using the results reported by others, there was found to be a small but significant difference between the results obtained by this method and those of the Fick method. The dye-injection technic gives slightly higher values. During exercise the cardiac output results with the dye method show some variation due to the wide spectrum of hemodynamic responses displayed. It is concluded that the injection method of estimating cardiac output can be used at exercise as well as during rest.

Shuman


The response of pulmonary artery systolic and diastolic pressure to acute elevation of left atrial mean pressure was explored in animals with an open chest. The elevation of pressure within the left atrium had been effected by the production of simulated mitral stenosis. Observations were made only in the presence of a well-maintained systemic pressure level and in the absence of observable myocardial ischemia. Under these conditions, pulmonary hypertension was uniformly observed throughout all levels of elevation of left atrial pressure. Elevation of left atrial pressure from 5 mm. Hg to 10 mm. Hg causes a rise in pulmonary artery systolic pressure of an average of 0.6 mm. Hg for each 1 mm. Hg rise in the left atrium and a 0.68 mm. Hg rise in diastolic pressure. Elevation of left atrial pressure from 10 to 20 mm. Hg results in a rise of pulmonary artery systolic pressure by an average of 0.65 mm. Hg for each millimeter of left atrial pressure; for the diastolic pressure, there is a rise of 0.77 mm. Hg under similar conditions. Further elevations in left atrial pressure cause a
widened pulse pressure mainly due to rises in pulmonary systolic arterial pressure.

RINZLER


Tourniquet trauma produced an area of injury with fluid accumulation. By means of tracer doses of Na\textsuperscript{22} Cl and S\textsuperscript{35} plasma, the turnover of these substances in the fluid was studied. Radio-sodium equilibrated in one to two hours. Entrance of labeled protein into this fluid was much slower. There was 30 per cent equilibration in 2 hours, 55 per cent in 6 hours and 80 per cent in 15 hours. Fluid accumulated in the injured area behaves as a stagnant pool, when exchange of protein is used as a criterion.

Oppenheimer


Removal of the neurohypophysis was performed without producing any adenohypophysial dysfunction. Under these experimental conditions, glomerular filtration rate, renal plasma flow and tubular maxima are markedly reduced. Either Pituitrin or Pitocin reversed these observations but Pitressin was ineffective. The authors suggest that these results may constitute replacement therapy with the oxytocic fraction Pitocin. If this is true, it would provide an explanation for the presence of oxytocic principle in the male.

Oppenheimer


As indicated by dye time-concentration curves, delay in circulation time results in highest arterial oxygen saturation during the period of apnea. The time course of the curve of arterial oxygen saturation makes it unlikely that fall in oxygen saturation is responsible for end of period of apnea.

In one patient with chronic Cheyne-Stokes respiration, a lesion of the middle pons was subsequently discovered. In a second patient, diagnosed as having pseudobulbar palsy, embolic lesions from mitral stenosis with atrial fibrillation were thought to have involved corticobulbar pathways. The respiratory center has inspiratory and expiratory components in the medulla. A pneumotaxic center in the pons regulates the respiratory center and is itself regulated by higher centers in the brain. The authors believe that lesions of centers above the medulla altered the sensitivity of the medullary center so that a greater carbon dioxide tension was required for its stimulation. Delay in mean circulation time due to heart disease is probably a significant contributory factor.

Respirations became normal with the administration of oxygen. Carbon dioxide and amphetamine likewise abolished Cheyne-Stokes respiration without affecting peak arterial oxygen saturation.

One patient showed cyclic changes in consciousness with unconsciousness, relative constriction of the pupil, some drop in blood pressure and fall in mean circulation time coinciding with the apneic phase. Since oxygen saturation was highest during the period of apnea, anoxemia per se could not be held responsible for the changes in level of consciousness. Although they had no data bearing directly on this point, they suggest that the facts that carbon dioxide tension is lowest during the apneic phase (Harrison) and that cerebral blood flow is directly related to carbon dioxide tension (Kety and Schmidt) may account for the observations recorded.

McKusick


From the data detailed in this report, it appears that moderate ischemia, a result of diminished coronary blood flow, can induce specific metabolic changes in heart muscle. A metabolic break may occur between pyruvate and acetate in the glycolytic cycle, which may be explained by inhibition of cocarboxylase.

Waife


It is concluded from these experiments that renin infusion increases capillary permeability for labeled protein. There was also a rather small effect on the reticulo-endothelial system. Aniotonin formed during the infusion is responsible for changes in the dye disappearance curve (rate).

Oppenheimer


Livers from dogs in irreversible hemorrhagic shock contain a lethal factor which is absent from livers of normal dogs. This factor depends on bacterial action during the state of shock. After a two hour bout of hemorrhagic hypotension most dogs recover when transfused. However, such dogs will not recover if they receive an intraperitoneal injection of mashed liver from a dog in terminal hemorrhagic shock although similar mashings from normal dogs also permit recovery as in normal controls. The bacterial factor is also fatal to the donor from which it was obtained at a period longer than two hours. This donor will recover subsequent to transfusion if previously treated with appropriate antibiotics. Bacterial activity and irreversible hemorrhagic shock are closely related. Most normal dogs do not succumb to the bacterial factor. Dogs in hemorrhagic shock succumb because they have lost the ability to inhibit bacterial activity within two hours after shock begins.

OPPENHEIMER


Reticulo-endothelial activity was depressed by thorotrast, antihistamine and evisceration. Under these circumstances the dye disappearance rate was decreased. Histamine increased rate of dye disappearance. This was explained in part by stimulation of reticulo-endothelial system. Nephrectomy increased dye disappearance rate, probably without the reticulo-endothelial system being changed.

OPPENHEIMER


Vasomotor tone is increased in dogs by pentobarbital. When large doses of ganglioplegic agents are given slowly to sick animals, arterial blood pressure tends to be maintained at or near control values. There is little change in cardiac output or peripheral resistance under these circumstances. The pharmacologic ganglion blockade is considered to be incomplete when these results are compared with spinal transection at C-6. Central blood volume is increased and circulation time prolonged by ganglionic blockade in supine anesthetized dogs. These effects are also different from those in dogs with prior spinal cord section. The authors point out the possible relation to pulmonary disease observed with hexamethonium therapy since ganglion blocking agents increased central blood volumes.

OPPENHEIMER


Using the plethysmographic method, the author studied the effects of periods of arterial obstruction and exercise before and after lumbar sympathectomy in a series of patients with occlusive arterial vascular disorders of the lower extremities. He found that the reactive hyperemia produced by arterial obstruction was unaltered by sympathectomy in limbs with no major arterial obstruction or in limbs which were the seat of common iliac or popliteal arterial obstruction. In patients with femoral artery occlusion or obstruction below the division of the popliteal artery, sympathectomy was associated with a greater increase in blood flow during reactive hyperemia. The time for the return of blood flow to normal after reactive hyperemia was decreased in all patients with arterial block.

The time elapsing after exercise for the calf blood flow to reach its peak was decreased after sympathectomy. In the case of long-standing arterial obstruction, the postexercise hyperemia was maximal immediately after sympathectomy and declined slowly until the fourth postsympathectomy month, after which it became stationary. No increase in collateral circulation was noted in this type of case. On the other hand, sympathectomy performed early in the course of an occlusive arterial disease appeared to accelerate the development of the collateral vessels.

ABRAMSON


The authors studied experimentally the effect of rapid high pressure intravenous injection as used in angiography, upon the pressure in the superior vena cava, the right atrium and right ventricle. In 12 dogs a catheter was introduced through a vein of one forelimb and an amount of 1.2-2.0 cc. per Kg. of physiologic salt solution, or contrast material, was injected through a vein of the other forelimb. The injection of the two materials caused irregularities of the heart and reduction of systemic pressures ascribed by the authors to chemical stimuli, but never a pressure elevation in the venous circulation. In none of the experiments was reflux to the inferior vena cava noted. It would appear that local pressure
alterations caused by the injection are completely balanced proximal to the point of the injection by the elasticity of the venous system.

PICK

PATHOLOGY


The author reports two cases, one with idiopathic steatorrhea and another with ulcerative colitis. Both had clinical and electrocardiographic evidence of prolonged potassium deficiency, widespread myocardial fibrosis with normal coronary arteries. The myocardial fibrosis is attributed to the potassium lack.

SOLOFF


Three cases of idiopathic cardiac hypertrophy, occurring in men aged 28, 38 and 43 years, are reported. These cases are said to bring the total number recorded in the literature to 49. The authors feel that these cases do not fit the criteria of beriberi heart disease. The weights of the hearts in the cases reported ranged from 600 to 800 Gm. Mural thrombi were present in the ventricular chambers in two of the patients. Congestive cardiac failure occurred in all cases. The authors review the various hypotheses which have been developed regarding the etiology of myocardial hypertrophy and the differential diagnosis to be considered in cases similar to those reported. It is suggested that the diagnosis of idiopathic cardiac hypertrophy should be considered when congestive heart failure and cardiac enlargement occur in the absence of angina pectoris, the electrocardiographic pattern of infarction or other demonstrable cause of failure.

ROSENBAUM


A case of endocardial fibroelastosis occurring in a 24-year-old white female is presented with the prime purpose of suggesting that this endocardial lesion, which is commonly seen in infancy, may indeed persist into adulthood. The cause for the pathologic changes was attributed to involvement of the Thesbian circulations. Anatomic evidence for this was observed in the narrowed mouths of the Thesbian vessels and of their lumina along their course in the myocardium.

RINGLER


The author reports the clinical and autopsy findings of two cases of multiple myeloma in middle aged women, 54 and 48 years old, in whom unusual cutaneous, cardiac and gastrointestinal manifestations of systematized amyloidosis were present. Bence-Jones proteinuria and bone marrow infiltration with myeloma cells were present in both cases. The older patient had generalized bone pain about two years before admission, followed within a year by the onset of angina pectoris and congestive heart failure, which was moderately progressive until death. In addition she developed virtually total alopecia and a patchy macular and papular erythematous skin eruption. Weight loss, anorexia, nausea and vomiting were prominent symptoms. The second patient presented with progressive bone pain about one year before death, with gradually increasing skin lesions consisting of confluent nodularity of the subcutaneous tissues of the anterior chest and abdomen and discrete nodules on the inner aspect of the left arm, and gastrointestinal complaints of anorexia, nausea, vomiting, cramps and ultimately obstipation.

In the first patient, amyloidosis was found in the walls of arteries of every organ examined, including the vasa vasaorum of the aorta. The cerebral vessels were spared. The heart was dilated and there was moderate ventricular hypertrophy. The coronaries were patent throughout. Nodular deposits of amyloid were present in the subendocardium of both sides of the interauricular septum and of the left auricle. Amyloid was demonstrated in the intramyocardial vessels but none in the ventricular muscle itself. Focal areas of myocardial degeneration and fibrosis were present in both ventricles. The heart of the second patient was grossly normal except for left auricular endocardial thickening as a result of nodular infiltrations of amyloid beneath the endocardium. In addition there were scattered foci of amyloid in the epicardial fat and connective tissue septa around muscle fibers of the left auricle and both ventricles.

Both patients had gastrointestinal amyloidosis, the first one principally of blood vessels, the other of both blood vessels and intestinal musculature from esophagus to rectum. Scalp biopsy of the older patient revealed amyloid in the stroma around hair follicles and sebaceous glands. In the other patient there were amyloid deposits in subcutaneous tissues as well as discrete and confluent deposits of amyloid in the connective tissue of the subcutaneous fat.

This report again notes the clinical and pathologic similarity of primary systematized amyloidosis and the amyloid associated with multiple myeloma.

CORTELL

The authors review cases of pericardial diverticulum in the literature and add one of their own. The ages of the patients range from 24 to 75 years. Symptoms associated with the disorders were not found helpful in making the diagnosis. Roentgenology was the most valuable preoperative study. A smooth round mass was generally noted in either hilum on a plain chest film. Its contour was found to change during respiration, being long and narrow in inspiration and short and broad in expiration. Microscopic examination of the lesions generally revealed the wall to be composed of loose connective tissue, with the lining of the cyst of endothelial or mesothelial origin.

ABRAMSON


A 57-year-old woman is described who developed recurrent congestive heart failure following intensive radiation therapy for metastases to the spine and ribs of a breast cancer. She succumbed after 10 years of observation. The clinical symptomatology was that of constrictive pericarditis.

At autopsy, the pericardium was thickened to an average of 4 mm. The heart by itself was microscopically normal except for ischemic alterations of the subendocardium of the left ventricle. Histologically, a few carcinoma cells and infiltration with inflammatory cells was found within the pericardium. This chronic pericarditis is ascribed by the authors entirely to the radiation therapy which consisted in application of 13,000 r concentrated, from three directions upon the precordial region. Despite the development of the severe pericardial reaction and its consequences, the case is considered a therapeutic success because of the patient's 10 year survival after detection of the metastases.

PICK


A pathologic study was made of 12 consecutive cases of myasthenia gravis in whom postmortem examinations were obtained during the past five years at the Mount Sinai Hospital. Three of the cases studied had malignant thymomas, one had a benign thymoma and three cases showed persistent thymus tissue. Six of the 12 cases showed histologic alteration of the myocardium, ranging from scattered focal atrophy and vacuolization of the myofibrils, with accompanying slight lymphocytic infiltration of the connective tissue septums (resembling lymphorrhages) to severe, extensive myocardial necrosis. The latter was accompanied by abundant inflammatory reaction, consisting of polymorphonuclear leukocytes, lymphocytes, and mononuclear cells, with occasional multinuclear "giant" cells. The severer forms of myocardial involvement were found in the cases with thymic tumors, benign or malignant.

Seven of the cases showed striated muscle involvement, the milder ones having the classical small "lymphorrhages." However, in four of the cases actual necrosis of muscle fibres with secondary inflammatory reaction of varying intensity was present. The more severe forms of striated muscle involvement were seen in the cases manifesting severe myocardial damage.

There were no clinical aberrations of the cardiovascular system during life in the patients in this series, although thorough clinical and electrocardiographic study was not made in each patient. However, patients with definite myocarditis at autopsy had normal electrocardiograms during life.

CORTELL

PHARMACOLOGY


The purpose of the method is the determination of the concentration of radioiodine (I$^{131}$) in the plasma three days after a tracer dose, this concentration being expressed in per cent of the administered dose per liter of plasma. Carrier free radioactive iodine is used for the tracer dose and the standards. A well-type scintillation counter of such a size is used so that a 4 ml. sample of liquid in the test tube is completely contained within the well. Twenty-five to 100 microcuries of I$^{131}$ are administered by mouth in 100 ml. of water and the exact dose recorded. Seventy-two hours after the tracer dose, 10 ml. of blood are drawn by venepuncture and oxalated. Four ml. of plasma are used for the determination of radioactivity, correction being made for decay from the time of administration of the tracer to the time of measurement. If the sample has a concentration in excess of 0.26 per cent of the administered dose per liter, it is necessary to determine the protein-bound radioiodine (PBI$^{131}$), which is done by precipitation with trichloroacetic acid in the same test tube, washing to eliminate the inorganic I$^{131}$ and redisolving in 2M sodium carbonate or hydroxide and determining the radioactivity. Values of PBI$^{131}$ above 0.27 per cent of the administered dose per liter are considered indicative of hyperthyroidism.

An analysis of a group of patients composed of 400 euthyroids and 100 hyperthyroids has shown that by the use of the method described a correct diagnosis could be made in 98.5 per cent of the cases.

CORTELL


The authors induced ventricular fibrillation in the perfused isolated rabbit heart by electric stimulation and tested the efficiency of various methods in restoring normal rhythm. Injections of acetylcholine were not successful in any experiment. Variable results were obtained by (a) arresting the coronary perfusion, (b) infusion of adenosin triphosphoric acid (ATP), (c) injection of potassium and calcium, or (d) electric defibrillation. Consistently good results were obtained by cooling the heart by lowering the temperature of the perfusing fluid. Subsequent rewarming increased the frequency and force of the beats and restored normal rhythm.

SAGALL


Studies were undertaken to determine whether or not the cessation of the heart beat that follows severe hypothermia results from hypoxia of the myocardium. In experiments upon denervated dog heart-lung preparations, it was found that the presence of increased oxygen physically dissolved in the blood did not lower the critical hypothermic temperature producing ventricular fibrillation. The author concludes, therefore, that hypoxia of the myocardium is not a factor leading to hypothermic fibrillation of the ventricles in these preparations.

SAGALL


In this case report of thrombocytopenic purpura in a 31-year-old woman sensitive to quinine hydrobromide, the authors note that they were able to produce a prolonged bleeding time, petechiae, and thrombocytopenia in a normal volunteer by the concomitant administration of oral quinine and intravenous injection of plasma from the sensitive patient.

The serum factor was resistant to prolonged storage at −10 °C. In vitro platelet agglutination tests were positive in this patient only when quinine was added. The authors suggest that the antigen to which antibody is produced is a complex composed of an union between the drug and platelets.

WAIFE


Medical treatment successfully alleviates discomfort and provides comfort for most patients with angina pectoris and congestive failure. There are a group of perhaps less than 5 per cent who remain disabled and in great discomfort despite medical treatment. Records of 1,070 euthyroid patients falling in this small 5 per cent, each of whom had been incapacitated for months or years and each of whom was treated with I\textsuperscript{131}, were collected from 50 clinics throughout the United States. Of 720 patients with angina pectoris (approximately 200 also had evidence of congestive heart failure), 76 per cent showed worthwhile improvement. Three hundred and fifty patients with congestive failure alone showed improvement in 62 per cent of the cases treated. Patients with angina pectoris who may be expected to gain the greatest benefits from treatment with I\textsuperscript{131} are those in whom the disease has been relatively stationary, or only slightly progressive, over a period of one year or more. Patients with congestive failure should show some evidence of cardiac reserve, such as improvement in signs of congestive failure and other symptoms, on bed rest or with the use of diuretics and digitals. The basal metabolic rate in patients should be more than minus 10 per cent, and the patient should be alert, cooperative and emotionally stable. However, hyperactive tense patients are particularly favorable candidates. In the clinical management of these patients, small daily doses of thyroid are administered to maintain the lowest metabolic rate consistent with comfort. In intractable cardiac cripples who are usually considered for surgery, hypothyroidism induced by radioactive iodine gives improvement through medical means without the risk of surgical complications.

KITCHELL


The author studied the effect of local antibiotic powders and dry dressing in a series of 72 patients with stasis ulcers of the legs. Only three subjects were resistant to treatment, primarily because the medication caused a dermatitis. The substances used were chloramphenicol, bacitracin, sulfanilamide, diphenamid methylsulfate, chlorotetracycline, oxytetra-cycline, erythromycin, and bacitracin-polyoxymycin B sulfate.

The application of the powders permitted the production of granulation tissue and healing of the ulcers in most instances. There was a tendency in some patients for the lesions to recur or for new ones to form, but these responded to further powder treatment. The greatest drawback of the therapy was the cost of the drugs.

ABRAMSON


The extracardiac sites of action of strophanthin-K,
quinidine sulfate and procaine amide were studied by the injection of varying doses of these drugs into the third ventricle of unanesthetized mongrel dogs.

The intravenous injection of strophantin-K produced a variety of cardiac irregularities including paroxysmal ventricular tachycardia. Intravenous administration of equal or larger doses on later occasions or in other dogs did not cause these cardiac irregularities. Similar findings were likewise observed following the intravenous injection of quinidine. Again these were not seen after the intravenous administration of equal or larger doses of the drug. The centrally induced cardiac effects of these drugs were accompanied by autonomic manifestations resembling those seen in patients with digitalis or quinidine intoxication.

The arrhythmic effects of intravenous strophanthin-K could be prevented by the intravenous injection of either quinidine or procaine amide which induced anesthesia (stage III, plane II); they could be terminated or modified by intravenous quinidine sulfate, procaine amide or sodium pentobarbital; and they could be entirely blocked by intravenous hexamethonium chloride.

**Sagall**

**Russek, H. I., Zohman, B. L. and Dorset, V. J.:**


This report presents the results obtained in a five year study of the effect of 16 different agents on the electrocardiographic response to standard exercise tests in patients with coronary insufficiency. It was found that glyceryl trinitrate in therapeutic doses exerts a favorable effect upon the response to exercise as recorded electrocardiographically. Papaverine in doses of 1 to 2 grains intravenously or 3 to 8 grains orally is effective in abolishing the abnormal response to exercise. Such benefit was not observed with the usual therapeutic doses. The results obtained with Metamine (trinitrate biphosphate), Peri- vental, and Nitroglycerin were unsatisfactory. Unimpressive effects were observed with the use of Aminophylline, Roniacol, Priscoline, tetraethylammonium chloride, Octyl nitrate, Khellin, heparin and Dicumarol when tested by this method. Ethyl alcohol and morphine, although effective in modifying pain, did not improve the exercise response in these patients. Of all agents tested, Peritrinate remains the most effective drug tested for prolonged prophylactic therapy in angina pectoris. A 10 to 20 mg. dose afforded protection for 4 to 5 hours as judged by the two step test in the majority of patients studied.

**Shuman**


The prothrombin responses to water and to oil-soluble vitamin K preparations in patients under treatment with anticoagulants is compared. It is shown that oil-soluble vitamin K, is more effective than any other agent now available in combating drug-induced hypoprothrombinemia. In contrast, the water-soluble vitamin K preparations are unreliable and have an inconstant effect. In most cases vitamin K, in doses as low as 1 to 5 mg. orally has been observed to produce as satisfactory a response, in as short a time as four hours, as the large intravenous doses generally recommended.

In the event of severe bleeding due to oral anticoagulants, intravenous vitamin K, in a dose of at least 10 to 50 mg. is recommended in addition to whole blood or plasma transfusions, if the latter are necessary to combat shock. The dose must be individualized, with consideration given to source and severity of bleeding and reason for use of anticoagulant therapy. The smaller dose should be adequate when bleeding is moderate and resumption of therapy is planned. In hypoprothrombinemia due to absorptive difficulties water-soluble vitamin K substances or vitamin K, appear to be equally effective, the latter in amounts as small as 5 mg. intravenously.

**Bernstein**


Acetazolamide diuresis is associated with carbonic anhydrase inhibition in the renal tubules, producing an alkaline urine, excessive distal tubular excretion of potassium, and decreased tubular reabsorption of sodium and other cations, bicarbonate, and, consequently, water. Lack of toxicity in the heart and kidney is evidenced by failure to inhibit the activity of succinic dehydrogenase and adenosine triphosphatase in those organs. Such hemodynamic alterations as may occur after acetazolamide administration do not contribute to its diuretic effect.

**Bernstein**


The authors describe the results of treatment of 56 patients with carotid-sinus syndrome with irradiation over a period of fourteen years. The follow-up period was too short for adequate evaluation in 4 patients but the remaining 52 had spontaneous attacks of syncope, episodes reproduced by the examining physician and follow-up periods twice the length of any spontaneous remission. Medical treatment had not been sufficient to produce remissions. The total dose of irradiation to the affected sinus area was 500 r if unilateral and 400 r if bilateral. The average follow-up period was 3.3 years with the longest remission 14 years. Complete remission occurred in 58 per cent and an additional 12 per cent
were moderately benefited. The mechanism of relief is unknown but it is believed that it may be by depression of nerve endings. There were no complications as a result of treatment.

Rosenbaum


The author reported the effect of intravenous Arterenol or Neo-synephrine in the treatment of surgical shock in a series of 50 patients. The drugs were given by continuous slow infusion in a concentration of 4 μg. per ml. This was obtained by the addition of 4 mg. to 1 liter of a suitable vehicle. The rate of administration was such as to maintain the blood pressure at the desired level.

A satisfactory pressor response was obtained in all cases in which Arterenol was used and in 84 cases of the Neo-synephrine group. The results were found encouraging enough to justify further careful clinical observation and evaluation.

Abramson

PHYSICAL SIGNS


Intracardiac pressure studies of 12 individuals with congenital heart disease were used to detect timing of the auricular sound in relation to pressure changes. Phonocardiographic recordings indicate that the auricular sound has a double appearance, the first part of which is inaudible and is attributed to the muscular action of the auricle because it is related in time to the rise of pressure in the auricle. The second portion is audible and is attributed to a filling sound produced by blood entering the ventricle from auricular systole.

An auricular sound was audible in the twelve patients with congenital heart disease, 46 with hypertension, 29 with cardiac infarction, 4 with aortic valve lesions and 9 with heart block. The clinical electrocardiographic and radiologic findings in this group were compared to 100 with normal hearts, 86 with hypertension, 16 with recent and 62 with old infarctions and 42 with aortic stenosis all of whom did not have an audible auricular sound.

The auricular sound is not heard in health. It is especially audible in left ventricular hypertrophy of hypertensive origin but not of aortic valve origin. It may be heard in the presence or absence of heart failure. Persistence of this sound after infarction is an unfavorable sign.

Soloff


The authors introduce a new and simple device for calibration of heart sounds and murmur based on the production of a sound vibration of known amplitude and frequency over the chest wall and its transmission to the microphone. Clinical experiments in reference to best location for placing the calibrator and the transmission of the signal to various areas of the precordium area described. The experimental production in dogs of either pneumothorax or pulmonary effusion was used to study the effect of the presence of fluid or air in the pleural cavities on the signal. The authors discuss the merits of the sound signal in phonocardiography as compared with the electric signal.

Rinzler

PHYSIOLOGY


With the application of body cooling for cardiac surgery, the cardiac changes produced by this procedure assume great clinical importance. Various electrocardiographic changes occur in the cooled zone. These changes include a progressive lengthening of the Q-T interval and a growing inversion of the T wave denoting a progressive retardation of repolarization. Further cooling causes an R wave of increased amplitude and width indicating retarded activation. Single or repetitive extrasystoles arising in the cooled zone may lead to ventricular fibrillation. As cooling proceeds and especially if the temperature of the water falls below 10 C., an elevation of the S-T segment develops. This paper is a study of this phenomenon.

Copper thermode leads in direct contact with the heart were used to record chest leads in deeply anesthetized dogs. Curare was used to eliminate artifacts caused by somatic activity. In some animals the esophagus and stomach were removed to avoid artifacts. Local areas of the myocardium were cooled. Temperatures of 10 to 15 C. in the fluid flowing through the thermode were necessary to produce changes in the S-T segment. The sequence was as follows, inversion and prolongation of T wave, increase in amplitude of R and then delay in intraventricular conduction. A monophasic electrogram occurred indicating that cooling can almost completely disable the responsive mechanism. Elevation of the S-T segment does not occur until the broadening T wave encroaches on the complex of the next beat. This result suggested that the cooled tissue responds to a new beat before full recovery from the preceding one, so electric balance is achieved at a level above that at which the R wave began. Therefore, S-T elevation may not represent injury or unresponsiveness but may represent the ability of the heart to carry from one cycle to another a continuum of potential imbalance resulting from the fact that each beat is followed by another without time for complete electric recovery.

In order to test the validity of this concept the
heart was slowed by vagal stimulation. This extra
time for recovery allowed the S-T segment to return
toward normal. However, prostigmine stimulation
of the vagus slowed the heart but did not depress the
elevated S-T segment.

Cooling of the myocardium slows recovery, impairs
conduction and, if continued, causes a reversible
diastolic depolarization of the cooled area. Each of
these factors may be responsible for the S-T segment displacement. Application of these concepts to
electrocardiographic changes caused by ischemia is
suggested.

Holland, W. C. and Dunn, C. E.: Role of the Cell
Membrane and Mitochondria in the Phenomenon

Membrane permeability of the intact cell is affected
by cholinergic compounds, anesthetics and cardiac
glycosides in a rapid and reversible manner. The
functional state of the cell is changed and perme-
ability to Na and K is altered. Ion transfer in
isolated mitochondria is largely unchanged under
the influence of similar agents. On the other hand
such metabolic inhibitors as dinitrophenol, malonate
and fluoracetate effect ion permeability of intact
cells and isolated mitochondria in a similar
fashion. The authors make the following suggestion:
permeability phenomena of short and transient na-
ture, nerve impulses, muscle contraction and anes-
thesia, are concerned with membrane permeability
changes but slower metabolic ionic changes in
resting or basal states and recovery are related to the
properties which reside in mitochondria.

Oppenheimer

Allison, P. R. and Linden, R. J.: Bronchoscopy
Approach for Measuring Pressure in Left Auricle,
Pulmonary Artery, and Aorta. Lancet 1: 9 (Jan. 1),
1955.

Extending their previously described technic for
left atrial puncture, the authors describe puncture of
the pulmonary artery through the anterior wall
of the trachea just above the carina and of the aorta
at a site 2 to 3 cm. higher in the trachea. Typical
pressure curves are demonstrated. The authors sug-
gest that in mitral disease the technic is useful in
the differentiation between stenosis and regurgitation,
in following the postoperative course, in distinguishing
restenosis or inadequate dilatation from other
factors responsible for unfavorable course, and in
distinguishing those patients in whom mitral ob-
struction is not the major cause of the symptoms. In
59 of 61 patients, the forecast of finding at operation
(as to the presence or absence of regurgitation) was
correct. No illness or death was encountered in the
121 patients in whom the procedure was performed.

McKusick

Berson, S. A. and Yalow, R. S.: Critique of Extra-
cellular Space Measurements with Small Ions;
Na\textsuperscript{24} and Br\textsuperscript{82} Spaces. Science 121: 34 (Jan. 7),
1955.

Curves showing the fraction of total Na\textsuperscript{24} or Br\textsuperscript{82}
in the body per liter of plasma, expressed over 24
hours or more, have multiple components. Between
15 minutes and one hour after intravenous admin-
istration, the concentration decreases almost expo-
entially with a shallower slope than in the early
phase (0 to about 15 minutes). The earliest curve
probably represents mixing in the extracellular fluid,
while the second phase is attributable to penetration
into cells or bone. Assuming that intracellular pene-
tration proceeded at the same rate throughout the
first period as during the second, the extracellular
fluid volume could be obtained by zero time extrap-
olation of the second phase.

Estimations in man seem to bear out these con-
cepts. The results are reproducible and are in good
agreement with results obtained by insulin or sucrose.
In edematous subjects, however, values derived from
the extrapolation of the slow component underesti-
mates the true extracellular space because of slow
equilibration.

In nonedematous subjects small, freely diffusible
ions distribute into a large but not complete volume
of the extracellular fluid within 15 or 20 minutes.
Some intracellular sites probably have also been
penetrated by this time. These values, which cannot
be considered a precise measure of extracellular
fluid, are grossly in error when this fluid volume is
markedly increased.

Waife

Ashworth, D. and Nahum, L. H.: Auricular Excita-
bility of the Normal Dog Heart. Yale J. Biol. &
Med. 27: 168 (Dec.), 1954.

Electrodes were permanently implanted on the
auricles of dogs to permit study of the excitability
cycle in a normal physiologic environment. The
curves obtained soon after implantation were unin-
fluenced by injury effects as substantiated by histo-
logic studies. The auricular electrograms showed a
QRS, S-T segment and a T wave. The curves of
excitability were all similar, showing an absolute
refractory period, a relative refractory period with a
smoothly declining slope, and a constant diastolic
threshold level. Total refractory period had about
the same duration as the auricular electrogram. The
recovery period in the auricle was shorter than in
the ventricle, a finding which is probably due to the
same factor which causes faster conductivity in the
auricle. A super-normal period was clearly demon-
strated in 18 per cent of the cases. This may have
been due to some alteration of the normal physio-
logic state by the manipulations.

Ens elberg
ABBREVIATIONS

RHEUMATIC FEVER, RHEUMATIC HEART DISEASE, COLLAGEN DISEASES


Comparative studies concerning the diagnostic value of various laboratory tests in acute rheumatic fever and its complications are reported. None of the laboratory procedures is specific for the disease and only one, an elevated sedimentation rate, is found in all instances. A normal sedimentation rate rules out active rheumatic fever whereas a greatly accelerated sedimentation rate does not permit exclusion of other diseases like rheumatoid arthritis, Still’s disease, bacterial endocarditis and osteomyelitis. The blood fibrinogen level becomes diagnostic if it exceeds 8 Gm. per 1000 cc. Additional laboratory confirmation is obtained by finding an increase of α₂-globulines with γ-hyperglobulinemia. An elevated antistreptolysin and antihyaluronidase titer is of help in the differential diagnosis because neither a bacterial endocarditis, a viridans infection nor chronic forms of polyarthritis lead to their elevation. The diagnostic problem is, however, very great when a subacute bacterial endocarditis develops on top of active rheumatic fever. Chorea may or may not show the same abnormal laboratory findings as rheumatic polyarthritis. In the presence of a normal sedimentation rate and a fibrinogen level under 5 Gm. occurrence of cardiac complication of chorea is very unlikely.

Biologic tests are of utmost importance in the evaluation of rheumatic activity when clinical manifestations have subsided. Most valuable in this respect are the determination of blood protein fractions and in particular the sedimentation rate which permits quick recognition of clinical silent bouts of reactivation.


The use of antibiotics, cortisone, corticotropin and salicylates in the treatment of rheumatic fever is discussed. Penicillin is important to use to eliminate the hemolytic streptococcal carrier state as well as to prevent such infections in patients who have recovered from rheumatic fever. Although the value of cortisone and corticotropin in rheumatic carditis is not yet established beyond question, present evidence is encouraging, especially when therapy can be started within a few days of onset of illness. These hormones are of little benefit in longstanding subacute and chronic carditis. The value of salicylates in carditis is still less clear but the meagre evidence is sufficiently hopeful to warrant the combined use of this drug with cortisone. Salicylate is preferable to cortisone or corticotropin for the treatment of rheumatic polyarthritis without evidence of carditis.

A plan of treatment is suggested. Penicillin should be given at once in sufficient doses to eradicate the hemolytic streptococcal carrier state in any patient with rheumatic fever. Prophylaxis should then be begun and continued indefinitely to prevent further infection with hemolytic streptococi. In the absence of carditis, salicylate alone is preferable to hormone therapy. If C-reactive protein has not disappeared by the end of four weeks, it is probable that the patient has smoldering carditis and cortisone is indicated. In the presence of carditis, 300 mg. of cortisone daily by mouth should be started at once. After six weeks the dose is reduced to half a tablet (12.5 mg.) daily. Further treatment is indicated if C-reactive protein is still present after six weeks. A transient rebound, when hormone is stopped, does not call for further treatment. If a true relapse occurs or if clinical or laboratory evidence of continuing lowgrade carditis persists, cortisone should be resumed. To minimize the rebound phenomenon it is advisable to continue salicylate dosage at a level of 0.03 Gm. per pound of body weight daily for three weeks after cortisone has been stopped.

HARRIS


A clinical and phonocardiographic study, made in 43 patients at the first attack of rheumatic fever, was repeated until either recovery or a definite chronic course was evident. Twenty patients had systolic murmurs at the apex, pulmonic or aortic areas at the first observation. The murmurs decreased or disappeared in one-half and increased in the other half of the patients. One-third of the basal systolic murmurs were transmitted; two-thirds were of aortic or pulmonic origin. A significant pulmonic systolic murmur was present in one-half of the cases in the beginning, in one-fourth at the end. A significant aortic systolic murmur was present in one-fifth of the cases at the beginning and end of observations. Thirteen cases with a systolic and diastolic murmur at the apex were all severe. At the end of observation nearly two-thirds showed no further evidence of the diastolic rumble. Four cases had an apical systolic and an aortic diastolic murmur at first observation. The aortic diastolic murmur subsequently decreased in one case and persisted or increased in the others. Four cases had minimal, diffuse murmurs.

In comparison with auscultation, phonocardiography presents the advantages of: (1) giving objective proof of the existence of murmurs, extrasounds or both; (2) allowing gross evaluation of the intensity of a murmur through electric and clinical calibration; (3) giving a picture of the “shape” and “aspect” of the murmur; (4) confirming the complete disappearance of a murmur.

Mitral commissurotomy should be restricted to patients with significant and progressive disability due to mitral stenosis. Its use in asymptomatic patients is not justified because of the present surgical risk (3-5 per cent in better risk patients). The technical success depends upon the surgeon's experience with this procedure. A given patient can be improved only to the degree that his cardiovascular disability is caused by simple mechanical obstruction at the mitral valve. With good surgery and proper medical evaluation many patients have improved, at least on a short term basis. The ideal patient is one with "pure" mitral stenosis whose disease has progressed only to the stage of pulmonary congestion. Mitral commissurotomy is less satisfactory in patients whose disease had advanced beyond the phase of pulmonary congestion and into the stage of "right heart failure." In patients over fifty years of age the surgical risk is increased but gratifying results have been achieved in a number of older patients. Active rheumatic fever or carditis is an absolute contraindication to mitral commissurotomy. Auscultation is unreliable in evaluating patients with prominent apical systolic murmurs since this does not guarantee the presence of a significant mitral regurgitation. Often, despite a loud apical systolic murmur, the patient is found to have severe mitral stenosis without significant insufficiency and has derived considerable benefit from mitral commissurotomy. All such patients deserve the benefit of special study, including an angiocardiogram, before a final decision is reached. Aortic and tricuspid valvular disease need not disqualify a patient from surgery under certain conditions.

HARRIS


In the development of rheumatic fever certain factors appear to be of importance. Listed in the order of their apparent importance, they are (1) streptococcal infections, (2) hereditary predisposition, (3) environment (stress), (4) endocrine status (adrenal), and (5) dietary intake and nutritional status. Rheumatic fever has its peak incidence at 9 years of age and is rare under 5 years of age, but may occur at all ages. Approximately 2 to 3 per cent of streptococcal infections give rise to rheumatic fever. The treatment should be directed towards eradication of existing streptococcal infection, prevention of future invasion of the body by streptococci, rest, suppression of symptoms, provision of a well-balanced diet and gradual resumption of activity after all signs of active disease have disappeared. Once the disease has become inactive, recurrent attacks may be prevented by preventing streptococcal infections. This can be accomplished by the administration of 0.5 to 1 Gm. sulfadiazine daily, or by oral administration of 200,000 units of penicillin twice a day. Prophylaxis should probably be continued for five years after the last attack or until adolescence, whichever occurs first.

KITCHELL


The diagnosis of rheumatic heart disease requires recognition of the etiology of the process and evaluation of myocardial, endocardial and pericardial lesions, as well as of possible lingering activity of the rheumatic process. The history and physical examination often answer the question whether the patient is a rheumatic; the electrocardiogram frequently establishes myocardial damage; various laboratory tests and clinical findings help in the diagnosis of activity. Murmurs should be evaluated carefully. The differential diagnosis between the apical diastolic murmur of mitral stenosis and that of "relative" stenosis caused by carditis is aided by phonocardiography. The differentiation between "pure" mitral stenosis and mitral insufficiency plus stenosis may be necessary in relation to possible surgical repair of the valve. The following diagnostic methods are reviewed: (1) physical examination and low frequency tracing, (2) auscultation and phonocardiography; (3) electrocardiography and vectorcardiography; (4) ballistocardiography; (5) pressure tracings of the left atrium; (6) esophagocardograms; (7) roentgenograms and roentgenkymograms; (8) electrokymograms. "Pure" insufficiency or stenosis is recognized without difficulty by means of physical data plus electrocardiography, phonocardiography and roentgenology. Demonstrations of associated mitral insufficiency in a case of mitral stenosis may be difficult and use of various subsidiary diagnostic methods may be necessary.

In mitral insufficiency a ventricular pressure pattern (positive plateau-like wave) is transmitted to the left atrium. Esophagocardiology, roentgenkymography, electrokymography, direct measurements of atrial pressure and digital exploration permit recognition of this abnormal pressure wave which causes systolic expansion of the atrium.

The various technical aids for diagnosis of associated aortic, pulmonic and tricuspid defects are discussed.

HARRIS


A cinematographic study of motion of the aortic valve produced by an artificial pump is made of 30 stenosed aortic valves and the effect of post mortem valvotomy in 25 and of valvotomy in life in six. The uncalcified stenotic valve can be easily divided.
Forceful dilatation may damage a mobile cusp if the other two are fused. Gross calcification militates seriously against a successful functional operative result.

SLOFF

An attempt is made to estimate the number of cases which might be considered potential candidates for mitral surgery. The calculations indicate that about 1.5 person per thousand of the Swedish population, about 10,000 cases, have mitral stenosis. This figure is lower than that presented by others, in particular by Wood for Great Britain.

Two factors will have a great influence on the magnitude of this surgical problem: the limitations of indications to surgery, and the spreading of knowledge concerning the feasibility of the operation among physicians and laymen. A further important factor will be the decision concerning early operation on asymptomatic patients. A review of the literature reveals that, at present, opinions vary concerning advisability of surgery at this stage of the disease.

PICK

Method and results of hormonal treatment in 267 cases of acute rheumatic fever are reviewed with one year followup. The authors preferred cortisone and used the following doses: 100 mg. daily for children under 5; 150 mg. for children between 5 and 10; and 200 mg. for children between 10 and 15. In the first 48 hours an additional dosage of 50 mg. per day was also given. The average length of treatment was 15 days; in severe cases, it was continued from 2 to 4 weeks longer, until the sedimentation rate was under 20 mm. per hour.

In 23 cases with severe carditis and congestive failure, a good result was obtained in 17 while six children died. In a second group of patients, 131 cases, with carditis but without cardiac failure, 125 responded favorably while 6 died from cardiac failure, despite therapy. In another group of 113 cases with no cardiac involvement on admission, only 2 presented minimal symptoms at the time of discharge.

The authors conclude that cortisone should be the drug of choice for treatment of rheumatic fever with or without carditis.

LUIJSA

The authors reason that, in the presence of obstruction to the forward flow of blood at the mitral orifice, the left ventricle fills slowly and inadequately despite the development of a large pressure head and flow tends to continue throughout diastole in contrast to mitral incompetence in which the combination of a high atrial pressure at the end of systole with no forward obstruction produces a rapid and early filling of the left ventricle. They therefore use the characteristics of the diastolic portion of the pulmonary artery wedge wave to determine whether mitral stenosis or incompetence is dominant when there is clinical evidence of both. The rate of fall (mm. Hg per second) of the diastolic portion of the pulmonary artery wedge wave divided by the height of the v wave expresses this relationship. A value greater than 1.6 is unlikely to occur in pure stenosis or one associated with trivial incompetence.

SLOFF

Previous studies had shown that a reaction resembling the generalized Schwartzman phenomenon could be produced with soluble products of group A streptococci. Intravenous injection of an extract of a streptococcal skin lesion, followed by a second intravenous injection of either a filtrate of a culture of Salmonella typhosa or a reduced culture filtrate of streptococci which had a high titer of streptolysin O, produced a reaction, the prominent features of which were death and necrosis of cardiac muscle, the latter being described as myofiber necrosis.

Further studies reported here, give strong although indirect evidence that streptolysin O is the active provoking factor in the reduced filtrate. Some of the properties of the factor produced in the streptococcal lesion which potentiates the activity of streptolysin O were also demonstrated. The active material is produced by many but not all strains of group A streptococci and is heat labile, withstands lyophilization and may be of large molecular size.

CORTELL

Plasma 17-hydroxy corticosteroid concentrations measured in patients during various phases of rheumatic fever activity were elevated early in the course of acute rheumatic fever and decreased as the disease progressed. Patients with well established active rheumatic fever, inactive rheumatic fever and Sydenham's chorea had circulating concentrations of these steroids, significantly lower than the control group. The finding of elevated plasma steroid levels in patients with early acute rheumatic fever is interpreted as indicative of a "stress response." The sub-
sequeant depression of these steroid levels to ab-
normally low values during continuing rheumatic 
activity indicates a relative failure of the adrenal 
cortex to comply with demand. This, combined with 
the demonstrated ability of these patients to produce 
adequate elevations of steroid levels in response to 
exogenous ACTH, suggests that a “relative adrenal 
insufficiency” exists in patients with rheumatic fever. 
Existing data do not eliminate the possibility that 
the anterior pituitary rather than the adrenal cortex 
is to be implicated in the failure of patients with cer-
tain phases of rheumatic fever to maintain usual 
circulating concentrations of 17-hydroxycorticoste-
roids.

HARRIS

Vogl, A., Blumenfeld, S. and Gutner, L. B.: Diag-
nostic Significance of Pulmonary Hypertrophic 

Seven cases of pulmonary hypertrophic osteo-
arthrophy are presented in which the following 
classical features of the syndrome occurred: (1) Bone 
pain, which is acute in onset, deep-seated, burning in 
character and aggravated by lowering of the ex-
tremities; (2) stiffness of the fingers; (3) muscular 
weakness; (4) brawndened or cylindrical appearance 
of the distal thirds of the extremities produced by a 
firm, hardly pitting edema; (5) redness, glistening, 
warmth and perspiration of the skin of the affected 
regions; (6) intense tenderness to pressure over the 
affectef bones and pain on passive motion of the 
adjacent joints; (7) progressive clubbing and dusky 
discoloration of the tips of fingers and toes; (8) rapid 
disappearance of pain and swelling after successful 
treatment of the underlying process. Correct diagno-
sis is important for two reasons: (1) the condition is 
often very distressing and yields to no treatment 
other than elimination of the underlying primary dis-
ease; (2) it not only indicates the presence of serious 
disease of the lungs, particularly pulmonary car-
cinoma, but may precede the appearance of respira-
tory symptoms in pulmonary carcinoma by several 
months, and thus aid in its early diagnosis. Evidence 
is presented to support the view that abnormally 
increased peripheral blood flow plays a role in the 
pathogenesis of pulmonary osteoarthrophy. This 
derangement of peripheral circulation may be de-
pendent upon some pathologic intrathoracic reflex 
which is promptly abolished by surgical removal of 
the affected lobe or of an extrapulmonary mass.

Despite the identity of the anatomic changes in the 
hereditary types of congenital clubbed fingers and 
idiopathic hypertrophic osteoarthrophy with those of 
the “pulmonary” type of osteoarthrophy, the 
latter apparently is a separate morbid entity.

HARRIS

Taylor, H. E. and Strong, G. F.: Pulmonary Hemo-
siderosis in Mitral Stenosis. Ann. Int. Med. 42: 
26 (Jan.), 1955.

Focal accumulation of hemosiderin-containing 
phagocytes formed distinct nodules in the lungs of 
42 per cent of cases dying with advanced mitral 
stenosis. In a further 31 per cent the lungs presented 
the more classic findings of brown induration. The 
nodular aggregates of siderophages are considered 
to be the end result of repeated small pulmonary 
hemorrhages caused by chronic venous congestion 
and pulmonary hypertension. The hemosiderin 
can be released from the phagocytes within the lung and 
impregnate the elastica and capillary basement 
membranes of the alveolar septa. Fragmentation of 
elastica may result, but fibrosis was not prominent. 
Such aggregates when sufficiently large are opaque 
to x-ray films and may appear as milliary densities 

in radiographs of the chest.

WENDKOS

of Rheumatic Fever and Rheumatic Heart Disease 
(Jan.), 1955.

A summary of current data available from the 
literature and data obtained from statistical reports 
of the New York City Health Department indicates 
that there has been a significant reduction in the 
number of deaths in children from rheumatic fever 
and rheumatic heart disease in the past decade. Of 
greater significance, however, is the finding from the 
New York City data that there are fewer children 
who develop rheumatic heart disease. This is statis-
tically significant. Several factors are discussed con-
cerning this change. The development, and wide-
spread use of prophylactic antibiotic drugs is given 
the major share of credit for this decline.

HARVEY

and Laboratory Manifestations of the Postcom-
missurotomy Syndrome. Am. J. Med. 17: 826 
(Dec.), 1954.

The postcommissurotomy syndrome is charac-
terized clinically by chest pain, fever and cough, 
often with signs of pleuritis and pericarditis. It has 
appeared as early as ten days after operation and 
has recurring as late as fourteen months postope-

ratively. Its incidence varied from 10 to 30 per cent 
in different reports. The authors report their expe-
rience with this syndrome. Ten of sixteen patients 
developed the postcommissurotomy syndrome ten 
years to seven months following mitral commis-
surotomy. Seven patients had multiple attacks. 
Bacteriologic studies yielded negative results. Peni-
cillin prophylaxis was ineffective and antibiotics 
failing to modify the course. Salicylates appeared to 
abbreviate the illness. No significant change in the 
antistreptolysin-O titer occurred. The C-reactive 
protein was the most sensitive laboratory test for the 
postcommissurotomy syndrome and the most useful 
in management. The syndrome represents a self-
limited form of pericarditis and pleuritis induced by the trauma of surgery in patients with rheumatic heart disease. Salicylate suppressive therapy is recommended for all postcommissurotomy patients. The C-reactive protein test is suggested as a useful and sensitive test for the activity of the postcommissurotomy syndrome.

HARRIS


Although no specific diagnostic test for rheumatic fever exists and there is no reliable test for rheumatic activity when the patient is being treated, the laboratory may be helpful in the diagnosis of rheumatic fever and in guiding the medical management of the disease by providing an index of rheumatic activity. The demonstration of serum antibodies to individual antigens of group A streptococci has proved to be valuable for detecting the occurrence of recent streptococcal infections. The most practical and feasible test is the antistreptolysin O test. At least 80 to 90 per cent of patients with rheumatic fever have definite elevations in antistreptolysin titer early in the course of the disease. The limitations on the diagnostic usefulness of this test imposed by the fact that not all patients respond with significant increases of antibody to this antigen can be overcome by laboratories which can carry out tests for other streptococcal antibodies. A second limitation is that this test is not specific for rheumatic fever.

The time-honored test for rheumatic activity is the determination of the erythrocyte sedimentation rate. Because of its simplicity and relative reliability, it will continue to be the most widely used single test for rheumatic activity. Its limitations include insensitivity and a poorly defined range of normal. Alternate procedures employed for estimating rheumatic activity include: total leukocyte count, the Weltmann serum coagulation reaction, determination of serum mucoprotein, measurement of non-specific hyaluronidase inhibitor of serum, measurement of serum complement, determination of serum C-reactive protein, the bactericidal activity of the blood versus Bacillus subtilis, a serum precipitation reaction with a quaternary ammonium salt and a diphenylamine color reaction with serum.

The most widely used of these procedures at present is the determination of C-reactive protein in the serum. Except in cases of pure chorea, C reactive protein is always present in the serum in acute rheumatic fever and the amount is proportional to the severity of the illness.

HARRIS


The incidence and morbidity of rheumatic fever can be reduced significantly by appreciation on the part of physicians and the general public of the importance of early diagnosis and proper therapy of streptococcal disease and upon diligent protection of rheumatic subjects from streptococcal infection. There are two effective approaches to the prevention of rheumatic fever by the use of antibiotics. The first is protection of the highly susceptible rheumatic subject from repeated attacks of the disease by maintaining continuous chemoprophylaxis against new streptococcal infections. The second is prompt and adequate treatment of streptococcal pharyngitis in the general population to reduce the incidence of first attacks of rheumatic fever. The major limitation of the chemotherapeutic approach to the prevention of rheumatic fever is the difficulty of clinical identification of streptococcal sore throat. To avoid the promiscuous and unnecessary administration of penicillin to patients with viral and nonstreptococcal upper respiratory infections, the clinical criteria for the diagnosis of streptococcal pharyngitis should be more widely recognized. Simple coryza, cough, hoarseness and tracheitis are rarely due to streptococci. The syndrome of sudden onset of fever, sore throat, “beefy” redness of the pharynx and pharyngeal exudate suggests the diagnosis. Cervical lymphadenitis and the presence of leukocytosis add further evidence for it.

Penicillin appears to be the drug of choice for prophylaxis or therapy. Various routes of administration are discussed by the author. For continuous chemoprophylaxis 200,000 to 250,000 units of oral penicillin daily, 1,200,000 units of benzathine penicillin intramuscularly once monthly or 1 Gm. of sulfadiazine daily is recommended.

HARRIS


Treatment of streptococcal infections with penicillin nine days after the onset of illness eliminated the infecting organism from the throat, failed to inhibit antibody formation appreciably, and significantly reduced the attack rate of rheumatic fever. In contrast, the administration of sulfadiazine during the acute streptococcal illness suppressed antibody formation somewhat more effectively than penicillin at 21 days but did not eradicate the organism nor prevent rheumatic fever. The patients who received no specific therapy sustained maximum antibody formation, remained carriers and experienced the usual attack of rheumatic fever.

The data strongly suggest that the development of rheumatic fever requires the presence of living streptococci throughout convalescence. This conclusion is in conflict with certain hypotheses pre-
ABSTRACTS


The total blood volume was determined by using the radioactive iodinated (\(^{131}I\)) human serum albumin method in 55 normal subjects and one hundred patients with rheumatic heart disease. The patients with rheumatic heart disease included those in and not in congestive heart failure. The average total blood volume in 45 normal individuals was 75.1 c.c. per Kg. The average total blood volume in 54 patients with compensated rheumatic heart disease was within normal limits. The average total blood volume in 20 patients with congestive failure was elevated above that of the normals and fell progressively as compensation was restored in nine of eleven subjects studied serially. Of 59 patients with a normal total blood volume undergoing surgery, two died and one developed congestive heart failure for a combined morbidity-mortality of 5.6 per cent. Four of the 26 patients with an elevated blood volume died following surgery, and eleven developed decomposition for a combined morbidity-mortality of 57.7 per cent. This morbidity and mortality of patients with elevated total blood volumes who were operated upon for acquired heart disease were sharply increased beyond normal expectations, regardless of the clinical picture.

Rinzler


Fifteen unoperated patients with mitral stenosis were evaluated thoroughly by conventional methods including a standardized exercise tolerance test. Approximately one year later, a reevaluation was made on the 12 surviving patients. Three class IV patients died of congestive failure during the interval. The impressive clinical changes in the patients, examined after one year, were the reduction in the incidence of symptoms, signs and treatment of pulmonary congestion and cardiac edema. There was no substantial change in the clinical classification of their functional capacities. Presumably, the improved status represented recovery from the precipitating factors responsible for the manifestations of cardiac insufficiency that prompted the patients to seek medical consultations. The exercise tolerance tests revealed improvement of only borderline significance with respect to physical fitness indices, endurance and respiratory efficiency. These changes reflect the improved pulmonary function associated with a decrease in pulmonary congestion. The authors conclude that the patients should not be submitted to surgery unless there is persistent disability secondary to pulmonary engorgement, despite prolonged medical treatment. The exercise tolerance test supplements the clinical appraisal and may be useful in determining the optimal time for surgical intervention. It is emphasized that measurements of functional capacity should be made post-operatively to determine whether a significant change occurs within a year or so after commissurotomy.

Shuman


Clinical and autopsy records of 100 cases of aortic stenosis without significant involvement of other valves are reviewed and the clinical symptoms and signs and the course of the disease examined in relation to the severity of the lesion. Aortic stenosis was marked in 49, moderate in 32 and mild in 19 cases. The mean age for the group was 69 years. Men outnumbered women three to one. Symptoms in general were those of heart failure. One-third of the patients complained of pain referable to the heart; in only half of these was the pain diagnostic of angina pectoris. Typical angina was more often accompanied by coronary atherosclerosis than was atypical cardiac pain. Dizziness was a symptom in one-quarter of the group, and syncope was reported in one-eighth. Even in the presence of severe aortic stenosis, systolic basal thrill and murmur were often absent, the second aortic sound frequently was judged normal, and the diastolic pressure not infrequently was low and was associated with a wide pulse pressure. A harsh systolic murmur, loudest at the apex or heard exclusively at the apex, at times was the only physical sign of aortic stenosis. Systolic and/or diastolic hypertension was present in one-third of the patients. Electrocardiographic evidence of left ventricular hypertrophy was seen in only 38 per cent of the tracings reviewed, while auricular fibrillation was present in 30 per cent.

The nature of symptoms and their severity appeared of little aid in assessing the degree of stenosis, perhaps because of the degree of associated coronary atherosclerosis, myocardial fibrosis and aortic regurgitation. A rapid evolution of symptoms favored a high degree of stenosis. An absent second aortic sound, an aortic systolic murmur grade IV or louder in intensity, or an aortic systolic thrill favored marked stenosis. Blood pressure and pulse pressure
ABSTRACTS

were of limited value in assessing the degree of stenosis, but a narrow pulse pressure indicated moderate to marked stenosis. While the asymptomatic phase of the disease was often long and permitted the attainment of advanced age, once cardiac symptoms had appeared, the prognosis became guarded. The appearance of congestive failure was a grave sign, as was atrial fibrillation. When either of these was accompanied by cardiac pain or syncope, death followed within weeks to months.

BERNSTEIN

ROENTGENOLOGY


A series of 6439 adult patients were studied by means of routine photofluorograms upon admission to the Hospital of St. Raphael during 1953. On the basis of this admission photofluorogram 709 patients were suspected of having a cardiovascular abnormality. The followup study of 595 of these patients revealed cardiovascular disease in 497 of them (83 per cent). One hundred and ninety-six (47 per cent) were unaware of the cardiovascular disorder. The study was limited to ambulatory patients. The study included a left lateral view in addition to the routine posteroanterior film, except in patients who were very obese and in the prenatatal group. The lateral view was of value in appraising the influence of body build, scoliosis and pectus excavatum upon the cardiac configuration observed in the posteroanterior projection. Although the lateral view did not increase the absolute yield of abnormal cases, it did help to increase the accuracy of the reading.

ROSENBAUM

SURGERY IN HEART AND VASCULAR SYSTEM


Aneurysms and occlusive lesions, the most common forms of aortic disease, are associated with progressively disabling manifestations and a grave prognosis. Therapy of these conditions consists of extirpation of the lesion and restoration of function by the use of aortic homografts or orlon cloth prosthesis. The success of this form of therapy is dependent upon a number of factors, such as the nature, extent and location of the lesion. In occlusive disease with well developed collateral circulation and localization, there are few or no limitations to the safe performance of the procedure. In aneurysms, however, the type and location of the lesion is very important in determining the feasibility of the procedure. In saccular lesions tangential excision and lateral aortography may be readily done anywhere on the aorta. Fusiform aneurysms, requiring resection of the involved segment of the aorta, impose the necessity for temporary arrest of aortic circulation. Aneurysms, arising below the origin of the renal arteries, pose less of a problem than aneurysms of the thoracic aorta. Hypothermia may help in averting ischemic effects following temporary arrest of aortic circulation. There are two types of occlusive disease of the abdominal aorta; those with complete and those with incomplete block. Resection with homograft replacement is the treatment of choice where the occlusive process is localized to the terminal aorta and bifurcation but in cases associated with extensive and diffuse peripheral arteriosclerosis obliterans the procedure is contraindicated. Of the 150 patients undergoing aortic resection, 89 were operated on for aneurysm; in 13 the thoracic aorta was involved; in 76, the abdominal aorta. The remaining 61 patients were operated for occlusive disease, 10 for coarctation and 51 for thrombo-obliterative disease of the abdominal aorta. In the group with aneurysm there were 20 deaths, or an operative mortality of 22 per cent. In the group with occlusive lesions there were two deaths and a mortality of 3 per cent. Oron cloth prostheses have been used to replace the aortic bifurcation in 13 patients, with satisfactory results. With few exceptions, the surviving patients in this series have been completely relieved of their symptoms. The gratifying results obtained so far suggest that resection is the most effective means of dealing with aneurysms and occlusive disease of the aorta.

KITCHELL


The paper is concerned with those patients in whom clinical evidence and arteriographic proof indicates segmental occlusion of one of the major arteries leading to the lower extremity. The methods of clinical detection are discussed. Data, concerning 22 patients surgically treated for segmental occlusion of a major artery leading to the leg, are presented. Eight cases with aortic and iliac blockage were treated by thromboendarterectomy, two by excision and replacement by stored hemografts. Twelve cases had resection of occluded areas of the superficial femoral artery with replacement by autogenous saphenous vein grafts.

RINZLER


The authors review the pathophysiology of rheumatic heart disease and discuss the indications and surgical treatment of rheumatic valvular heart disease. Of all the methods, suggested and in some cases attempted, only the valvulotomies for mitral
stenosis and pulmonary stenosis have given results that have established them as suitable in the surgical treatment of the various valvular lesions caused by rheumatic fever, other infectious diseases or of congenital origin. They are also the only operations that do not carry an undue mortality rate and are technically easy enough to be recommended for general use. With the use of extra-corporeal oxygenation and circulation, perhaps combined with hypothermia, heart surgery will enter a new era and operative methods now impossible to conceive will add to the possibilities of treatment in patients with rheumatic heart disease.

HARRIS


The author discusses the method of dilating or tearing the commissures by passing the first joint of the finger through the valvular orifice. After this is performed with the gloved finger, umbilical tape is wrapped around the first joint of the finger and a second glove is applied and the valve is further dilated. This is repeated in stages until the valve is enlarged to the desired degree. In 15 months this method was used on about 200 patients and has almost eliminated the creation of mitral valve regurgitation as a complication of valvotomy.

KITCHELL

VASCULAR DISEASE


In the past few years an increasing number of cases of peripheral arterial deficiency, having involvement of relatively short segments of the large arteries supplying the lower limbs, have been recognized. Although pathologic distinction from ordinary arteriosclerosis is not clear, these variants of occlusive arterial disease are amenable to direct surgical methods of treatment. Twenty-seven such cases were observed by the authors. They point out that although angiography is important, there are distinguishing clinical features that often make possible a differential diagnosis on clinical grounds alone. Follow-up observations extending from 3 weeks to 11 months in 14 cases of segmental arterial occlusion involving 19 operative procedures yielded good results in 76 per cent of the instances. In those cases not benefited by the treatment the condition of the affected limb was not made worse by operation. It, therefore, appears that resection with arterial homograft replacement is a promising method of treatment. In two such operations involving cases of diffuse arteriosclerosis with incidental segmental occlusion and impending gangrene, one ended in failure. However, theoretic considerations would suggest that in selected cases of peripheral arterial disease due to diffuse arteriosclerosis resection and arterial grafting may offer some help.

KITCHELL


Four groups of 8 week-old white Leghorn cockerels were placed on a high cholesterol diet, two of the groups receiving a daily injection of 8 mg. of a butacaine-heparin complex (equivalent to 3 mg. heparin) intramuscularly for 8 weeks, the other two groups serving as controls. There was no statistically significant inhibitory action of heparin on the incidence and severity of thoracic aorta atherosclerosis. However, there was a decrease in total plasma cholesterol and other lipid fractions after four weeks of heparin injection. Chronic heparin injection also tended to prevent the rise of Sf 10–20 class molecules which was observed in the cholesterol-fed chickens.

The possibility is discussed that the failure to obtain clear-cut results may be due to the difficulty in maintaining an adequate blood level of heparin, despite the use of a slowly absorbed heparin complex such as the butacaine-heparin preparation.

CORTELL


Cholesterol labelled with either isotopic carbon or hydrogen was administered orally to human subjects and the incorporation into plasma cholesterol was observed. By use of labeled acetate and cholesterol it was possible to study both exogenous and endogenous cholesterol metabolism.

Traces of orally labeled cholesterol were detected in the plasma within one hour, but maximum radioactivity was not attained until two or three days. On the other hand, the peak of specific activity of plasma cholesterol formed in vivo from labeled acetate was eight hours.

Aside from the early differences in the appearance times, the data suggest that cholesterol derived from the diet is eventually indistinguishably mixed with cholesterol synthesized in the body.

WAIFE


Beta-Aminopropionitrile produced lesions of the epiphyseal plates, degenerative arthritis and dissecting thoracic aortic aneurysm, when fed to wean-
ing rats in concentration of 0.1 to 1.0 per cent. These lesions appear to be histologically identical with those of lathyrism (diets of sweet pea seeds). The aneurysm was fatal in one rat after 32 days of feeding at the 0.4 per cent level.

WAIFE


A case of aortic arch syndrome (pulseless disease) in a 46 year old woman caused by progressive obliteratorive vascular disease of unknown etiology is described. Over a period of 15 years the process had led to total occlusion of both subclavian, the left common carotid, and the right vertebral arteries, with nearly complete loss of pulses in the arms and neck, right sided hemiplegia and loss of vision in the left eye. In view of the advancing impairment of cerebral circulation, bilateral stellectomy and resection of the thrombosed left common carotid artery were performed. The resected portion showed the histologic pattern of endangiitis obliterans. The symptomatology and possible etiology of the syndrome are discussed and attention is drawn to a clinical entity described previously under the term "arteritis in young females."

PICK


Blood viscosity was measured as the time required for 0.1 ml. of blood to flow through a 25 gauge needle inserted in a vein under standardized conditions.

Hamsters on a high fat diet were given a single fat meal of 2 to 3 ml. of 35 per cent cream and the blood viscosity determined at frequent intervals afterwards. The increase in viscosity which was first noted about 3 hours after the cream feeding reached its peak in 6 to 9 hours. By the end of 24 hours, the viscosity returned to normal, but there was a significant drop in hematocrit. This is thought to be due to "sticking" of erythrocytes. The increase in viscosity was associated with hyperemia, cyanosis, and a reduced bleeding tendency.

Heparin injections produced a transient reduction of the excess viscosity.

WAIFE


The South African Bantu habitually eats a diet containing about half as much fat as the American diet. This study reports a survey of blood cholesterol levels among 218 Bantu subjects of all ages. Up to age 40 there was no significant difference between mean values for the Bantus and those reported by Keys from Minnesota. After this age, however, the serum cholesterol levels are significantly lower among the Bantus.

The urban native, consuming a European diet (higher in fat), had a significantly higher mean cholesterol level than the rural Bantu. Other factors, such as caloric intake, liver disease, and racial stock, seem to have little importance in influencing serum cholesterol levels. Probably the low fat diet was the most significant factor, although the high fibre content of the diet may also bear some responsibility.

WAIFE


The authors presented several illustrative cases of arterial spasm and thrombosis following local trauma to a limb and drew certain conclusions from them regarding the proper therapeutic approach. They pointed out that one could not depend upon sympathetic interruption alone, since traumatic spasm of large arteries is not always due to overactivity of the sympathetic nervous system. Fasciotomy is of definite value in arterial lacerations if there is a tense subfascial hematoma constricting the collateral blood supply. Furthermore, in cases of complete arterial obstruction as a result of spasm or thrombosis, a similar firm swelling may occur due to intense edema of ischemic muscle, and under these circumstances the constricting envelope can also be released by fasciotomy. If exploration reveals a segment of artery in spasm, topical papaverine may prove efficacious in removing this state. If spasm persists and if the length of involved vessel is not too great, it is probably advisable to resect this portion and reestablish continuity with a venous or arterial graft or by reanastomosing the cut ends.

ABRAMSON


Total serum lipids, total cholesterol, alpha and beta lipoprotein determinations were performed on eight patients with arteriosclerotic disease, 39 control subjects and 17 subjects with lipemia; both sexes were represented with an age range of 20 to 55 years. Among the normals, the beta lipoproteins were found to be higher in men in their twenties than in women of the same age. No variations were observed in the alpha lipoprotein, greater than that seen in the controls. These values gradually decreased with the passage of time. There appears to be no apparent relationship between lipids, cholesterol and the
lipoproteins. Of the eight atherosclerotic patients, all showed at least one elevated serum lipid or total cholesterol or both. In the lipemic group an elevated beta lipoprotein was obtained in about 50 per cent of those studied.

SHUMAN


Little more than casual notice has been given to the presence of multiple intracranial arterial aneurysms. Therefore, an analysis of this problem in terms of its significance seemed indicated.

A review of the literature shows that the incidence of multiple intracranial aneurysms was slightly over 10 per cent. One impression gained from this review indicates that multiple aneurysms occurred more frequently than they were found or reported as their discovery required diligent search. Data collected from the Albany Hospital autopsy files showed nearly 25 per cent of intracranial aneurysm cases to be multiple. Only 5 per cent of these were found at operation. Occasional mention has been made of bilateral or symmetrical aneurysm, and the literature is reviewed in detail on this point.

With the advent of angiography, x-ray film demonstration of multiple aneurysms has frequently been made and the desirability of bilateral carotid angiography has been advocated. Rarely do two of the aneurysms rupture simultaneously. However, reports do mention the leakage of a second aneurysm at some subsequent period. The possibility that a second aneurysm might become symptomatic should be kept in mind. Intracranial aneurysms do not seem to be associated with extracranial aneurysms or other types of intracranial vascular lesions.

Anomalies of the circle of Willis, coarctation of the aorta and congenital polycystic renal disease have been found in association with berry type intracranial aneurysms often enough to be noteworthy. Since all of these lesions represent developmental defects, their coexistence may be more than coincidental and, therefore, merits attention. It is possible that the altered hemodynamics resulting from the vascular anomalies may favor the development of aneurysms. Arteriosclerosis, congenital defects, and elevation of intravascular pressure are possible causes. Multiple miiliary aneurysms have been found. Myotic intracranial aneurysms are not often multiple. They are usually caused by septic emboli and occur in small arterial twigs. Syphilitic intracranial aneurysms are rare.

WECHSLER


Two cases of renal vein thrombosis and one of constrictive pericarditis with the nephrotic syndrome are described. In the last patient, a 50 year-old woman with otherwise typical constrictive pericarditis, there was also proteinuria of 13 to 17 Gm. per day, serum albumin of 1.6 Gm. per cent, serum cholesterol of 702 mg. per cent. After cardiac decapsulation, the serum albumin rose to 5.0 Gm. per cent, serum cholesterol fell to 245 mg. per cent and the proteinuria disappeared.

MCKUSICK


The mortality of subarachnoid hemorrhage falls into two categories: those cases in which death is due to the first attack, and those in which the patient succumbs to a subsequent bleeding. A great deal of attention has been given to the latter since many of these people can be helped with definitive treatment. The physician is able to offer only palliative and supportive treatment to those who die in the first attack, which group represents approximately 28 per cent of all cases with subarachnoid hemorrhage. Only four of the signs found in this condition are reported in the literature in sufficient detail to be analyzed for their prognostic significance. These signs are coma, convulsions, hypertension, and papilledema. The appearance of any of the first three signs, singly, is indicative of a poor prognosis for life. Age has no effect on the mortality rate. Approximately 10 per cent of all patients with subarachnoid hemorrhage are maimed to a significant degree. Aneurysm with subarachnoid hemorrhage occurs in the neighborhood of 50 per cent of cases. A frequent contraindication to surgery is multiplicity of the aneurysm, which is present in about 13 per cent of all patients that have aneurysms. This finding shows that a thorough angiographic study is indicated before surgical treatment is done.

BERNSTEIN


The authors describe a woman aged 20 years who died of a dissecting aortic aneurysm during the fifth week of her first pregnancy. The patient had been hypertensive prior to the pregnancy. This is said to be the thirty-seventh reported case of dissecting aneurysm during pregnancy. Approximately one-half of the cases of dissecting aneurysm of the aorta which have been recorded in women under the age of 40, were pregnant at the time. In the reported case there was considerably medionecrosis of the aorta, proliferation of the vaso vasorum with early rhexis and hemorrhage into degenerated media and sclerosis of advential vasa in the ascending aorta.

ROSENBAUM
ABSTRACTS

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