ABSTRACTS

Editor: Samuel Bellet, M.D.

Abstracts

David I. Abramson, M.D., Chicago
Arthur Bernstein, M.D., Newark
Ruth Cortell, M.D., New York
A. D. Dennison, M.D., Indianapolis
Charles D. Enselberg, M.D., New York
Alfred Froese, M.D., Philadelphia
Benjamin A. Gouley, M.D., Philadelphia
Raymond Harris, M.D., Albany
John C. Harvey, M.D., Baltimore
J. Roderick Kitchell, M.D., Philadelphia
Aldo A. Luisada, M.D., Chicago
Morton H. Maxwell, M.D., Los Angeles
Victor A. McKusick, M.D., Baltimore

Morton J. Oppenheimer, M.D., Philadelphia
Alfred Pick, M.D., Chicago
Seymour H. Rinzel, M.D., New York
Francis F. Rosenbaum, M.D., Milwaukee
Elliot L. Sagall, M.D., Boston
David Scherf, M.D., New York
John B. Schwedel, M.D., New York
Charles R. Shuman, M.D., Philadelphia
Franklin Simon, M.D., Newark
Louis A. Soloff, M.D., Philadelphia
Ralph M. Tandowsky, M.D., Hollywood
S. O. Waife, M.D., Indianapolis
Martin Wendkos, M.D., Philadelphia

Stanford Wessler, M.D., Boston

BACTERIAL ENDOCARDITIS

The author records the results of his examination of the coronary arteries and the myocardium in nine successive cases of bacterial endocarditis. All but one showed gross scars of varying size, and two of them showed fresh infarctions. Microscopically almost all showed infarcts, old or recent, embolism within small branches of the coronary arteries, and in two cases there were calcific granulomas. None of the vessels showed significant atherosclerosis, and while five of the nine cases showed rheumatic valvular lesions, the author considered the larger scars to be of embolic origin. In one case, Cortisone therapy was associated with strikling septic emboli and infarctions. There were no constant or diagnostic changes in the electrocardiogram. Sudden death occurred in five cases.

Gouley


Prior to the use of antibiotic and chemotherapeutic agents, spontaneous healing of subacute bacterial endocarditis was rare. The authors report an unusual case in which there occurred spontaneous healing of subacute bacterial endarteritis associated with a patent ductus arteriosus with closure of the ductus. Two courses of treatment with sulfonamides had been tried without avail in this patient. This patient continued to have a rather stormy course for about one and one-half years, accompanied by frequent episodes of chills and fever. After this time, the temperature subsided and his clinical condition improved. The man is now, (15 years later) perfectly well, active and without symptoms. The present-day concept of the treatment of patients with patent ductus arteriosus complicated by bacterial endocarditis is discussed briefly.

Simon


In a series of 200 cases of bacterial endocarditis, anemia was found on initial examination in 150 patients (75 per cent). Anemia was more common than evidence of embolization, splenomegaly, cardiac enlargement, or clubbing of the fingers. Since inadequate antibiotic therapy may temporarily suppress the fever and bacteremia, the association of a cardiac murmur and an unexplained anemia should suggest the possibility of bacterial endocarditis. Occasionally cardiac murmurs may be absent in bacterial endocarditis; therefore the association of an unexplained fever and anemia should also suggest the possibility of this disease.

Kitchell

The authors report on serial electrocardiographic investigations in 200 cases of subacute bacterial endocarditis, before, during and after treatment. Frequent findings were left heart strain (70 per cent) and signs of left auricular pathology (40 per cent). Right heart strain, auricular fibrillation and signs of right auricular involvement were relatively rare (1.5 to 5 per cent).

Systematic electrocardiographic studies are important in subacute bacterial endocarditis since alterations of the curve during therapy can be corre-
lated with the course the disease is taking. Evidence of myocardial involvement is seen mostly in cases with negative blood cultures. The presence of such alterations before initiation of treatment does not permit prognostic conclusions. However, when abnormalities like bundle-branch block, A-V block, or, rarely, signs of myocardial infarction occur during penicillin therapy, the outlook of the case becomes poor—regardless of the clinical symptomatology.

**Pick**

**BLOOD COAGULATION**


A review of the literature has been made of cases of hemopericardium associated with anticoagulant therapy, and three additional cases are reported, two associated with bishydroxyecoumarin and one with ethyl biscoumacetate (Tromexan) therapy. This is the first reported case of hemopericardium associated with ethyl biscoumacetate.

The diagnosis of hemopericardium should be suspected in the presence of (a) recurrent chest pain without renewed electrocardiographic evidence of recent myocardial injury, (b) a prolonged and persistent or recurrent friction rub, (c) circulatory collapse accompanied by a drop in blood pressure, relatively sudden hepatomegaly, and distended neck veins, (d) sudden onset of unexplained anemia and (e) roentgenographic evidence of pericardial effusion.

**Bernstein**


Paritol is a synthetic heparinoid which acts to retard the clotting time of the blood by inhibiting the action of thrombin. Its effects were studied using animals and humans by measurement of the clotting time and prothrombin time. Single injections of the agents in several stages of purity produced prolongation of the clotting times for periods of 8 to 10 hours; therapeutic levels could be maintained by repeated injections. A slight effect upon the prothrombin time was observed. The more purified preparations caused minimal local reactions when given intramuscularly: With intravenous administration, they caused numbness and tingling of the fingers and toes; occasional transient hypotensive responses were observed. Paritol produced a rise in the blood urea nitrogen; in patients with renal disease, the urea retention was marked. Protamine sulfate was found to be an effective antidote for Paritol administration. The authors feel that the usefulness of Paritol is limited because of toxic reactions.

**Shuman**


Studies are reported of the clearing effect of intravenous heparin on lipemic plasma induced after a fatty meal in a total of 69 atherosclerotic and control patients. In 11 of 12 patients who received a dose of 3 mg. of heparin, the clearing of the plasma did not persist for one hour. When the dose of heparin was increased to 20 mg. the clearing effect failed to persist for two hours in all 10 patients who were tested. When heparin and the fatty meal were given simultaneously in 11 patients, no detectable difference was noted in the average degree of lipemia three hours later. The intravenous injection of 100 mg. of heparin per day for three days changed the response toward normal in four atherosclerotic patients. A similar effect was not noted in three atherosclerotic patients who did not receive heparin between tests.

**Simon**


The authors utilized an electrically driven and controlled treadmill ergometer to study the effect of heparin on intermittent claudication of six patients with arteriosclerosis obliterans. Marked variability in claudication time was noted in the same patient. No beneficial effects were noted after 4 to 14 weeks of treatment with heparin.

**Abramson**


The effect of heparin on the number of chylomicrons in the blood after ingestion of 150 ml. of a 13 per cent cream, was observed in four young and four old subjects. When 150 mg. of heparin was given intravenously two and one-half hours after ingestion of fat, the postprandial chylomicronemia was considerably reduced in both groups. An intravenous injection of 150 mg. of heparin simultaneously with ingestion of fat prevented the postprandial chylomicronemia. Doses of heparin down to as little as 1.2 mg. had a definite effect, but less than 1 mg. had a doubtful effect. Intramuscular doses of 50 mg. produced a moderate effect, but doses of 20 mg. were ineffective. Sublingual administration of 100 mg. of heparin simultaneously with ingestion of fat failed to produce appreciable effect.
It was found that protamine sulfate is able to obviate the heparin effect almost completely. It was also observed that protamine sulfate increases the spontaneous number of chylomicrons in fasting individuals.

Rosenbaum

CONGENITAL ANOMALIES


This study is concerned with the review of 19 cases, reported to the editors of this journal following a request one year earlier that physicians practicing obstetrics submit certain basic data concerning rubella contracted during pregnancy. The study of these 19 cases disclosed that when rubella occurred during the first trimester of pregnancy there was a risk of losing the conceptus in less than 10 per cent and a risk of a defective infant in 7 per cent of the cases. When rubella occurred in the second trimester there were 7 per cent stillbirths and 6 per cent defective infants. When pooled with the observations of other observers, the total risk of stillbirth or deformity was 17 per cent when rubella occurred in the first trimester of pregnancy, and 12 per cent when the infection complicated the second trimester.

Rosenbaum


Unless there is a serious contraindication coarctation of the aorta should be repaired surgically. The simplest and safest method of operative repair in most patients is resection with direct end-to-end anastomosis. If the stenotic area is too long or the adjacent aorta too diseased, the use of a graft may be necessary. The authors report a series of 23 patients subjected to operation. In three no repair was performed. Nineteen of the patients had a resection of the aortic obstruction and an end-to-end anastomosis. The other patient had a long atresia of the aorta, and the splenic artery was employed as a shunt around the obstruction. The one operative fatality resulted from cardiac arrest which appeared shortly after the removal of the aortic clamps. The postoperative complications consisted of one case of homologous serum jaundice, one transient radial nerve palsy, two paralyses of the left vocal cord, and one case of brain abscess. The short-term results of pre- and postoperative blood pressure was good.

Sagall


Nineteen adult patients, 10 men and 9 women of ages ranging from 17 to 51, were studied with respect to clinical and hemodynamic features of their interatrial defects by means of cardiac catheterization. The pulmonary arterial flow was often markedly increased but may be only slightly so. Slight to moderate pulmonary hypertension is a frequent finding and severe elevation rare. No apparent relation was found between flow pressure in the pulmonary arterial system. Right ventricular pressure work is increased usually. Prominent systolic murmurs, usually basal, are frequent and may be accompanied by a thrill. The frontal plane QRS vector is usually +90 degrees or more where the interatrial defect is significant.

Rinzler


The authors review the historical facts concerning operative repair of patent ductus arteriosus and the present means of diagnosis. Their operative series consisted of 22 females and 14 males, mainly children or adolescents. In 34 the ductus was closed using the suture-ligature technic. In 14 cases there were no murmurs after operation. Thirteen patients had persistent pulmonic systolic murmurs. In all cases, excepting one in whom there was evidence of recanalization, the results are considered to be good and the patients are leading normal lives. There were three complications and no deaths in the series. In two patients with reversal of the flow in a large ductus, exploration was carried out, but permanent interruption of flow through the ductus was not carried out.

Sagall


Three instances of patent ductus arteriosus complicated by severe pulmonary hypertension are presented.

The author believes that pulmonary hypertension is unrelated to the patent ductus and that the ductus should not be ligated if the pulmonary pressure is higher than the aortic. The diagnosis is difficult because (1) the characteristic murmur is replaced by a systolic pulmonic murmur and (2) cyanosis, greater in the lower limbs than in the upper, occurs only in the severer cases with a reversed shunt. Cardiac catheterization and angiocardiography may be necessary for diagnosis, and even these methods may fail if the pulmonary and aortic murmurs are nearly equal.

Soloff
ABSTRACTS


The authors report on observations, primarily environmental, possibly relating to the etiology of patent ductus arteriosus occurring in 166 instances. The mortality was lower and the instances of affected males higher in the first born of those with a higher maternal age. This observation is attributed to the better social status of the parents. There was a seasonal fluctuation in the incidence of affected females but this fluctuation was not attributable to rubella. A history of fetal distress was very common and occurred in 43 or 28 per cent of the affected individuals. This positive history is regarded as very significant. The incidence of congenital heart disease in younger siblings was higher than that of the normal population.

SOLOFF


The author describes anatomically and discusses three cases of an anomaly complex of the heart consisting primarily of (1) patency of the interventricular septum in the region of the roots of the great vessels, and (2) transposition or other anomalies of the great vessels external to the heart. It is posited that this anomaly complex results from a failure of or delay in endocardial cushion development during the period of septation, that is, from the fourth to the seventh fetal week.

MAXWELL

CONGESTIVE HEART FAILURE


Inhibition of carbonic anhydrase activity in renal tubule cells has been found to diminish the retention of sodium as well as impairing the tubular secretion of hydrogen ion. The sulfonamides have been found to be carbonic anhydrase inhibitors and one of the most active of these is 2-acetylamino-1,3,4,6-thiadazole-5-sulfonamide, known commercially as Diamox. The effect of this material was studied in 26 patients.

When administered intravenously increased water and sodium excretion appeared 30 minutes earlier than when the drug was given orally. All but three patients showed an increased 24-hour urine volume after oral administration of Diamox. The rate of sodium excretion increased in all subjects after Diamox regardless of the diuretic response with an average of 90 mEq. per 24 hours in those with a satisfactory diuresis and a mean increase of 30 mEq. in those with diuresis insufficient to control heart failure. Excretion of potassium increased in all patients after Diamox, but there was no correlation between changes in potassium excretion and clinical response. The effect of Diamox on chloride excretion was variable. When the drug was given in doses of 0.25 Gm. every eight hours for three or more days, there was a gradual diminution of its effect upon the excretion of water, sodium and potassium. It was found necessary to discontinue the drug for at least 48 hours before a renewed response could be elicited. When given in doses of 0.25 Gm. once daily no diminution in effect was observed. The most advantageous dosage schedule seemed to be 0.25 Gm. three times daily for two days, with courses repeated every two to seven days or continuous administration of 0.25 Gm. once daily. No serious toxic manifestations occurred. Mild drowsiness occurred in six patients and four had mild tingling of the fingers. No evidence of renal or hemopoietic disturbance was observed. It was felt that in 18 patients the diuresis, weight loss and clinical improvement which followed the oral administration of Diamox compared favorably with those after a mercurial diuretic given parenterally.

Rosenbaum


Slices of human cardiac muscle obtained by biopsy at the time of exploratory thoracotomy were incubated with C14-labeled digitoxin, in Warburg vessels. The activity of barium carbonate, which was recovered from carbon dioxide dissolved in potassium hydroxide in the center well of the vessels, was determined with a thin-window Geiger-Mueller tube and also a flow counter. No radioactivity was detected in the samples even though the slices respired at increased rate in the presence of glycolide. This suggests that digitoxin acts catalytically without conversion to C14O2 by the tissue.

Rinzier

CORONARY ARTERY DISEASE


The various mechanisms leading to partial or complete occlusion of a coronary artery were studied in serial histologic sections of excised coronary arteries in 126 cases who died from recent myocardial infarction. In 11.1 per cent there was only intramural bleeding due to arteriosclerosis, and in 16.7 per cent the same process was accompanied by sec- ondary thrombosis. Pure arteriosclerotic vascular occlusion was found in 25.8 per cent and arteriosclerotic stenosis with subsequent thrombosis in 37.7
per cent. In 8.8 per cent the presence of primary inflammatory lesions (coronaritis) was established, with or without secondary coronary thrombosis.

The findings were further analyzed with respect to the age and sex of the patients, their relationship to generalized arteriosclerosis, the pathogenesis of actual occlusion, and the localization of the resulting myocardial infarction. The significance of these anatomic findings, particularly that of intramural vascular bleeding, is discussed with respect to the therapeutic use of anticoagulants. It would appear that the beneficial effects of anticoagulant therapy dominate over its potential dangers.

**Pick**


Changes in the T wave, RS-T segment, and QRS complex of the electrocardiogram generally reflect myocardial ischemia, current of injury, or death of muscle, respectively. The T wave, the most labile and least specific feature of the electrocardiogram, may be affected by a great variety of factors, only one of which is ischemia. Changes in the RS-T segment usually, but not always, correspond to acute muscle damage. It is generally transitory and rarely permanent. Like the T wave, this may indicate an anatomic or a biochemical lesion. QRS changes practically always signify death or replacement of heart muscle; this is generally associated with coronary artery disease. Rarely it may result from heart muscle damage from other causes. The electrocardiogram is quite accurate in the detection of acute myocardial infarction but inaccurate in the diagnosis of old or of multiple infarcts. It remains to be seen whether the newer vectorcardiography will attain a greater accuracy.

**Harris**


This investigation deals with intraventricular potentials during normal sinus rhythm registered by means of a specially designed electrode located at various depths within the ventricular wall, the interventricular septum, and the papillary muscle of 32 dogs. A series of experiments was performed which established (a) that the presence of the plunge electrode in the myocardium did not alter the normal course of depolarization, and (b) that the depolarization complexes registered by the plunge electrode represented essentially local potentials.

Pure Q3 or R3 waves were recorded throughout at least the innermost two-thirds of the intramural myocardium in both ventricles as well as from all levels of the left papillary muscle. Intraseptal leads also exhibited essentially negative deflections, although considerable positivity was noted in the center and right side of the septum. Only the epicardial surface and a thin subjacent layer of the walls yielded predominantly positive depolarization complexes. In general, negative potentials were found to predominate in roughly 80 per cent of the musculature during ventricular depolarization, while about 20 per cent of the myocardium was predominantly positive. This observation indicates that the ventricular wall does not depolarize in the same manner as do the auricles.

Pure QS waves consistently were obtained throughout the left ventricular cavity as well as from all portions of the right ventricular cavity except in the immediate vicinity of the septum. Cavity leads recorded near the right septal surface occasionally displayed a small R wave derived from the initial positivity of the right septal surface.

The velocity of the depolarization wave was measured in 20 animals by timing the onset of the downstrokes in intramural leads from multiple depths of the left ventricular wall. As determined by this method, the rate of depolarization appears to be considerably more rapid in the innermost second-thirds of the wall than in the superficial layers.

Currents of injury, manifested by RS-T segment elevation, always occurred for a brief period following the introduction of the plunge electrode into the myocardium. The RS-T segment deviation was markedly less in subendocardial leads than in subepicardial leads, indicating that subepicardial muscle characteristically is capable of producing more intense injury currents than are the deeper layers of the myocardium.

The observed weakness of subendocardial injury currents in experimental animals suggests that the downward RS-T segment deviation, which is seen clinically in angina pectoris, is not attributable to subendocardial anoxia, as is generally believed. On the basis of the same experimental observation, a new theory concerning the cause of RS-T segment elevation following coronary occlusion is proposed which appears to reconcile apparent discrepancies among the electrocardiographic, anatomic, and pathologic findings. When a coronary artery is occluded, the entire subendocardial region, including the muscle surrounding the ventricular cavity, undergoes at least as severe anoxia as the overlying subepicardium. Nevertheless, as in the experiments, the subendocardial muscle experiences a less drastic impairment of polarization (and depolarization) than the subepicardial muscle, causing a potential difference between the two regions. Under such circumstances, current flows in the same direction as in primarily subepicardial injury, and the precordial electrode
registers an upwardly displaced RS-T segment, since it faces the positive side of the dipole. Thus the direction of RS-T segment displacement following coronary occlusion may be related to functional, rather than anatomic or pathologic, differences between the various layers of the ventricular wall.

RINZLER


Twenty-nine anesthetized dogs were subjected to inhalation of cigarette smoke at a tempo used by an ordinary smoker. In 10 of the dogs a branch of a coronary artery had been ligated prior to the experiment. Electrocardiograms were recorded during inhalation and afterwards until electrocardiographic alterations disappeared. These experimental data were then compared with human tracings obtained in nonsmokers following smoking of two cigarettes, and in habitual cigarette smokers following the smoking of a cigar.

The results were inconsistent in the animal as well as in the human group. Whereas in some tracings (including some abnormal tracings produced in dogs by coronary ligation) no alteration occurred after smoking, others revealed profound transient alterations consisting in depression of the S-T segment and/or inversion of T waves. In view of this variation of results the authors conclude that an abnormal electrocardiographic response to smoking depends largely on individual susceptibility. This varies in man as well as in the animal from case to case.

PICK


The plasma lipids were determined in 200 individuals with coronary artery disease and in 200 controls. Although there is individual overlapping, there was significant elevation of the plasma total cholesterol and plasma total-cholesterol/phospholipid ratio in all decades in the coronary artery disease group. Maximal elevation occurred in the earliest decade of the study in men with coronary artery disease. In the sixth decade in women, the value for the control group rose to the coronary artery group level.

SOLOFF


The descriptive term "cryoglobulin" has been applied to substances in serum which precipitate when the serum is exposed to cold temperature. The authors studied 69 patients with coronary-artery disease in regard to the presence of cryoglobulinemia. Four patients had severe angina and 65 had had a recent myocardial infarction. In 40.6 per cent of these patients small amounts of cold-precipitable substances were found in the serum. There was no correlation between cryoglobulinemia and high titers of cold agglutinins, positive dilution-turbidity tests, elevated blood cholesterol or sedimentation rate. Seven sera with negative cryoglobulin tests and nine with positive tests showed a normal viscosity at both 5 C. and 37 C. These findings make it unwise at the present time to attach any significance to the presence of small amounts of cold-precipitable substances in the serum of patients with coronary-artery disease.

SAGALL


In 35 cases of myocardial infarction, the authors used paper electrophoresis to study the inflammatory reaction of blood proteins to tissue necrosis. Within the first months subsequent to acute coronary occlusion, an increase of α2 globulins was found in 21 out of 23 analyses. In this first stage of the disease the intensity of the reaction is of no value for the prognosis and appears to be independent of the localization and extent of the infarcted area. When the disease takes an uneventful course the curve of α2 globulins returns to normal levels within the second month. In four cases with unexpected fatal outcome the curve reached a second peak two months after the attack.

PICK


The authors study the electrokymogram of the left ventricle after severe myocardial infarction with incomplete recovery. Incomplete recovery was admitted when a systolic expansion recorded by the electrokymogram revealed severe damage to the wall of the ventricle, or there was the clinical picture of heart failure.

Nineteen cases presented systolic expansion and no evidence of failure, while six others presented evidence of failure.

In the great majority of cases (19 in all), the tracing of the aortic arch, compared with the electrocardiogram, revealed a delay of ejection which exceeded 0.15 second, this being the highest delay still within normal limits.

According to Seghers and Hendricks, the ejection delay of left bundle-branch block would be mainly due to the conditions of the myocardium and not to the block itself. The present study seems to confirm their views by proving severe delay even without excessive broadening of QRS.

LUISADA

The high incidence of abnormal ballistocardiograms in older “normal” persons over the age of 50, and the relative frequency of normal records in those under 50 who have clinical evidence of coronary artery disease limit the diagnostic value of the resting ballistocardiogram for coronary atherosclerosis. The authors investigated “stress-eliciting” procedures, namely exercise and cigarette smoking, in 200 subjects to distinguish the clinically normal person from the patient with angina pectoris and/or remote myocardial infarction. The ballistocardiogram in 7.9 per cent of normal control subjects and in 31.4 per cent of patients with coronary artery disease deteriorated after exercise. The electrocardiographic response to exercise was positive by Master's criteria in 22.8 per cent of normal controls, and in 50 per cent of the subjects with angina pectoris or remote myocardial infarction. The ballistocardiogram in 6.8 per cent of normal control subjects and in 58.6 per cent of patients with coronary artery disease deteriorated after smoking a cigarette. This meant that the diagnostic margin between diseased persons and normal controls was 4:1 by the ballistocardiograph after stress, 2:1 by the electrocardiograph after stress and 9:1 by the cigarette test.

The authors however state that it is not their purpose to suggest the routine use of the cigarette test as a diagnostic procedure in patients, but rather to encourage further investigation of the effects of smoking and nicotine on the cardiovascular functions as studied by analysis of the form of the ballistocardiogram.

Rinzler

ELECTROCARDIOGRAPHY, VECTORCARDIOGRAPHY AND BALLISTOCARDIOGRAPHY


Normal ballistocardiograms recorded with a high-frequency table were compared with tracings taken simultaneously for each of three types of instruments which record the movement of a cross-bar placed across the shins. These instruments were photoelectric, piezoelectric, and an electromagnetic ballistocardiograph. Statistically, a high degree of correlation was found between the IJ and JK segments recorded with the table and the corresponding segments simultaneously recorded with each of the instruments studied. No significant correlations were found in individual subjects in the case of the JK:IJ ratio. The variation between the means of the JK:IJ ratio recorded in each of 10 subjects with the three instruments was not significantly different from the variation of the means of corresponding ratios recorded simultaneously with the table. The reproducibility of repeated tracings obtained with the instruments which record body motion directly was in general inferior to the reproducibility of tracings obtained with the table. This finding was particularly significant in the case of the photoelectric instrument.

Rinzler


Studies were made on the direct displacement ballistocardiograms of 84 of 90 young healthy medical students and student nurses. The data included time relationships between the ballistocardiographic waves, heart sounds, electrocardiograms, and the carotid and jugular pulses. The following relations were found: (1) a wide variation in temporal relations of the H peak; (2) a close temporal correlation between: (A) the K nadir and the second heart sound; (B) the L peak and the carotid incisura; and (C) the N peak and the jugular V peak; (3) an inverse relationship between the K-N time and the heart rate; (4) the occurrence of one or more waves during the period of diastasis; (5) a wide pattern variation of the G-H upstroke; and (6) a temporal relationship of the G-H upstroke to both the presystolic and isometric contraction phases of the cardiac cycle.

Rinzler


Among 44 cases of coarctation of the aorta, in ages 8 to 39 years, the electrocardiogram was normal in 6 (13.5 per cent) and revealed left ventricular strain in 36 (82 per cent). In 11 cases the latter was associated with left bundle-branch block, and in seven with right bundle-branch block. In two cases isolated complete right bundle-branch block was present. Left axis deviation is found more frequently in cases with an additional aortic valvular lesion (suggested by a diastolic murmur). No correlation could be established between electrocardiographic findings and the degree of stenosis or the height of the blood pressure. The finding of electrocardiographic alterations in a younger person with coarctation is an indication for immediate surgery, while in older persons such findings represent a contraindication in view of the possibility of higher risks involved.

Pick

The author investigated changes of the electrocardiogram which were produced by cauterization, or application of a caustic solution to the atria of dogs. The main alterations thus produced consisted in a positive or negative displacement of the P-R segment and were due to injury currents affecting atria repolarization (Ta wave). The polarity of displacement which differed in various leads, depends on the direction of the axis of a particular lead relative to the location of the injury. Thus, necrotic lesions of the posterior wall of the right atrium produced downwards deviation of the P-Q segment in leads II, III, aVF, in left precordial leads and leads from the atrial cavity, whereas upward displacement was recorded in aVR, aVL, in esophageal, epicardial and right precordial leads. Lesions of the left atrium generally produced P-Q deviations opposite in direction to those seen in right atrial lesions. A lesion of the right atrial wall, even if limited in size, almost invariably causes disturbances of cardiac rhythm (different types of A-V block, A-V dissociation and ectopic tachycardias including auricular flutter and fibrillation). Only exceptionally do such disorders develop as a result of damage to the left atrium.

From the clinical standpoint right precordial leads appear most valuable for the study of atrial lesions, since the atrial potentials recorded in these leads closely resemble those of direct epicardial leads.


The wide scatter of values for the measured Q-T interval and the obvious overlapping of these values in electrocardiograms of patients with marked differences in cardiac status would seem to throw doubt upon the value of the measurement in assessing the integrity of the heart muscle. On the other hand, the great stability of the measurement of the Q-Tc and its sensitivity as an index of the degree of carditis has been well established provided that the Q-Tc is calculated on the basis of averages derived from many cycles and several leads. This points up the well known physiologic principle that the cardiodynamic events as expressed in an individual cardiac cycle at a given moment do not mirror the total functional integrity of the heart. In normal hearts sinus arrhythmia, for example, there are short runs in which the heart action is rapid, followed by long runs of slow cardiac action. While the scatter of values in such an instance would be wide, the average value would be weighted by the long cycles. This average value is representative of the average cardiac functional activity. In patients with acute carditis, the scatter of Q-T values may be sufficiently wide to fall within the area of scatter of the normal group. In this instance, however, the average value is weighted by the greater number of cycles with long Q-T intervals in respect to the RR. The total functional activity here is represented by the long Q-Tc. Obviously, to differentiate between the functional integrity of the heart in health and disease, values which overlap and which are found in the scatter areas are representative. Thus, to obtain a true differentiation, enough cycles must be measured and averaged to represent the various phases of cardiac activity; however, emphasis in each case will be in the direction of the most dominant phase of cardiac activity.

Bernstein


The author reports the electrocardiographic pattern in 15 Bantu infants less than one day old. All had sinus rhythm, electrically vertical hearts and large RV. The transition zone in the precordial leads tends to occur between V3 and V4. A large R wave was always present in the right-sided chest leads. In two cases, an upright T wave became negative on passing from the right side of the chest to the left, and once a negative T wave on the right side became positive on passing to the left.

Soloff

ENDOCRINE EFFECTS ON CIRCULATION


Oxygen use and heart rate are low at birth, climb during the first month and decline to old age. Thyroidectomy produces a greater percentage fall in these parameters in the young with the result that the decline is not seen. Older animals are less responsive to thyroxine. A rat at 3 weeks uses less oxygen than at 2 weeks even though the former weighs more. Male rats have a higher oxygen use than females. If corrected for size males have faster rates. Stroke volume increases with growth. There is little change in A-V oxygen differences.

Oppenheimer


Depletion of adrenal ascorbic acid obtained after intravenous injection of renin, was not present in rats deprived of their hypophyses. This decrease in
ascorbic acid was not obtained if the renin was inactivated by heat. Antirenin from dog serum completely blocks the effect of renin. Dibenzyline (adrenergic blocking agent) only partly prevents the action of renin.

Oppenheimer

HYPERTENSION


What is believed to be the first instance of pheochromocytoma of the urinary bladder is reported from a woman aged 74 years. The tumor was an invasive one, yet there were no mitoses or signs of cellular dissociation. The tumor is believed to have arisen from paraganglionic tissue such as may occur in the adventitia and wall of the bladder. A review of the history after the nature of the tumor was learned, revealed that the patient had noted attacks of tachycardia and flushing of the face for three years prior to operation. Furthermore, rapid beating of the heart had frequently accompanied emptying of the bladder. These symptoms cleared after the operation.

Rosenbaum


The ranges and falls of pressures in 50 patients given hydralazine, 15 patients using hexamethonium and 14 using a combination of both hydralazine and hexamethonium are reported. The authors felt there was no way of predicting which patients would respond to therapy. Four patients who previously had had sympathectomies were treated, and their response was no different from that of other patients. All patients with a presumed renal hypertension responded well. Hydralazine hydrochloride is a safe, moderately effective, hypotensive drug which can be given to office patients. The incidence of toxic effects is high but these are transient. Hexamethonium is a powerful, dangerous, antihypertensive drug whose oral use results in unpredictable wide variations in blood pressure. It is not safe to start office patients on this therapy. Its main effect is brought about through postural hypotension. The use of this drug should be restricted to severe hypertension that does not respond to other measures. Combined use of these drugs results in only slight advantage. The authors feel these drugs should be used with caution in elderly and severely arteriosclerotic patients. Although these drugs are the best now available, they are not a completely satisfactory treatment for hypertension.

Kitchell


This is a report on the survival of 453 patients with different degrees of essential hypertension. They were first seen and classified more than 10 years ago and were recently subjected to intensive follow-up. In the classification, grade I included persons with minimal organic change in the three vital areas of head, heart and kidneys; grade II those with definite or marked change but no functional impairment; grade III those with organic change and functional impairment; and grade IV those with papilledema. The same series of cases was reported four years ago and six years ago. The treatment in these cases was chiefly dietary together with mild sedation and sometimes potassium sulfocyanate. These patients are considered valid controls with the results of surgical treatment or with those of any single medical treatment consistently followed. It is felt that because of the inevitable loss of patients from observation the mortality rates as given may be somewhat exaggerated. Several tentative conclusions are made: (1) relative risk is highest in the young and decreases rapidly with age; (2) mortality in women is lower (except for those in grade IV) and increase of severity is slower; (3) average age increases from grade I to grade III; (4) duration of disease apart from advancing age does not seem to have any effect on mortality except in grade IV; (5) survival rates relative to those of the general population follow simple patterns that may be expressed mathematically; and (6) with each increase in grade, patients die at a faster rate than that expected in the population at large, but this increase in mortality tends to diminish with time under observation or higher ages.

Kitchell


Basing their evaluation of therapeutic effects upon the percentage drop in the blood pressure of hypertensive patients, the authors found that the dietary sodium restriction and cation exchange resins combined with Apressoline exerted a beneficial effect. These results measured as reduction of blood pressure; improvement in cardiovascular and renal function were not observed when each of these agents were used alone. Side effects noted in certain patients included tachycardia, sensations of fatigue, giddiness, headache, and a maculopapular rash. Dibenzyline was of little value as a hypertensive agent when employed alone. Combined with low sodium cation exchange resin therapy, the blood pressure responses with this agent were quite vari-
able and fluctuating. Undesirable side effects included miosis with visual blurring, dizziness, muscular aching, weakness, headache and tachycardia. The authors emphasize the need for vigilance in keeping the patients on their low sodium diets when treatment with these drugs is undertaken.

SHUMAN


One of the pair in parabiotic rats often develops spontaneous hypertensive cardiovascular disease. Blood pressure returns to normal when the hypertensive rat is separated from the normotensive one.

OPPENHEIMER


Although splanchnic nerve stimulation was continued for two to three weeks, blood pressure was increased only during stimulation. During this time the heart rate was not increased. In some of the animals, there was an increase in renal plasma flow, glomerular filtration rate and filtration fraction. However, these changes were not statistically significant. The majority of the dogs showed enough renal vasoconstriction to keep blood flow through the kidney at constant values. The opinion is expressed that splanchnic vasoconstriction was the probable cause of the hypertension.

OPPENHEIMER


The present paper records, in hypertensive and normotensive women, the emotional effects on renal function of passing a catheter. Pronounced osmotic diuresis (diuresis attributable to increased excretion of sodium and chloride) was evoked in these patients. In two there was an associated water diuresis.

Of the 10 normotensive women, nine had small osmotic diureses and one of these, a pronounced water diuresis. Evidence is reviewed that the increased salt excretion is more likely to have been due to diminished tubular reabsorption than to associated increase in glomerular filtration rate. The authors suggest that emotional effects may have been responsible for abnormally high rates of salt excretion reported previously in certain circumstances in catherized hypertensives.

MCKUSICK


The effects of the intramuscular administration of 10 to 30 mg. of desoxycorticosterone acetate (DCA) daily for three to four days on five women in the last trimester of pregnancy, with no evidence of renal, cardiovascular or endocrine disease, were studied. Each patient received 9 Gm. of sodium chloride in addition to the regular hospital diet. Four of the patients demonstrated no change in blood pressure or pulse rate in the normal fall in blood pressure following tetraethylammonium chloride (TEAC) administration. Likewise, the administration of desoxycorticosterone acetate caused no change in cardiac output, heart size, electrocardiogram, water balance, or renal function, nor was there any indication of sodium retention or potassium loss. The excretion of 17-ketosteroids was unchanged during the period of desoxycorticosterone acetate administration, but one patient showed a significant suppression of corticosteroid excretion. Subsequent delivery in these patients was uneventful, and there was no evidence of decidual atherosis or placental infarcts comparable to those seen in toxemia. Desoxycorticosterone acetate administration in the dosage used failed to induce any of the changes seen in toxemia of pregnancy.

The fifth patient initially failed to show the usual fall in blood pressure when tetraethylammonium chloride was given, but otherwise demonstrated no abnormalities. During the three day administration of desoxycorticosterone acetate, there was a pressor response to tetraethylammonium chloride and in addition evidence of renal damage appeared. She subsequently died about six weeks later in severe renal failure, which clinically was believed to be an acute exacerbation of chronic glomerulonephritis, unrelated to the desoxycorticosterone acetate administration.

CORTELL


Constrictions were produced in the abdominal aorta above the renal arteries. An amount of constriction was used which produced a reduction in femoral pulse pressure, but not in the integrated mean pressure. After two to four days there was a significant rise in mean femoral blood pressure in six of seven dogs. The hypertension persisted. The authors suggest that reduction in renal artery pulse pressure may be a stimulus for the development of experimental renal hypertension.

OPPENHEIMER
Doyle, A. E., and Smirk, F. H.: The Use of the 
Pure Veratum Alkaloids Neogermitrine and 
Protoveratrine in Hypertension. Brit. Heart J. 

The authors examined the effects of oral veratum 
therapy in hypertensive individuals using Neo-
germitrine, Protoveratrine and various alkaloidal 
mixtures, and also compared the effects of proto-
veratrine and neogermitrine given by mouth and 
given by injection.

The effective dose of Neogermitrine varied from 
0.4 to 1.4 mg., of protoveratrine from 0.5 to 2 mg. 
and of the mixed alkaloids about 5 to 10 times 
greater. The maximum effect of the pure alkaloid 
takes place within one and one-half hours as com-
pared with two to three hours of the mixed alka-
loids. The therapeutic and toxic effects of all are 
similar. In most instances, the difference between 
the therapeutic and toxic doses of the pure alka-
loids was 0.1 mg.

The intravenous dose of Neogermitrine varied 
from 0.09 to 0.42 mg. and that of Protoveratrine 
from 0.19 to 0.30 mg. The maximum effect was 
obtained within 5 to 30 minutes. Fractional doses 
starting with 0.04 mg. followed by 0.12 mg. every 
two minutes were used. No patient responded to a 
subcutaneous dose who had failed to respond to 
oral medication.

None with basal diastolic pressures above 120 mm. 
Hg could be controlled for any length of time. 
Toxic effects appeared more frequently with con-
tinued use as the toxic and therapeutic doses 
approach one another.

Kaplan, S. A., and Assali, N. S.: Effects of Apreso-
line, Veratum Alkaloids, High Spinal Anesthesia 
and Arfonad on Renal Hemodynamics of Pre-
nant Patients with Toxemia and Essential Hy-
1953.

Evidence has accumulated that generalized arte-
riolar vasoconstriction and increase in peripheral 
resistance to blood flow are characteristic of the 
hypertensive states complicating pregnancy. More 
recently, it has been shown that increase in vascular 
resistance is not limited to peripheral channels but 
extends also to the cerebral and renal circulations.

The latter, in particular, has been subjected to 
careful study, and it appears that reduction of renal 
blood flow and glomerular filtration rate are usually 
present in toxemia and essential hypertension. 
These changes in renal hemodynamics are asso-
ciated with increase in resistance of the renal vas-
cular bed, particularly the afferent segment, to the 
flow of blood. The authors felt that it was of interest, 
therefore, to investigate the effects of some of the 
newer vasodepressor agents on the renal hemody-
namics of subjects with these syndromes. This 
information should be of vast importance since it 
has been shown that lowering of the blood pressure 
of normotensive pregnant patients, for example, by 
autonomic blockade with high spinal anesthesia, 
may be accompanied by active renal vasoconstric-
tion, and it is assumed on theoretic ground that 
further increase in renal vascular tone would be an 
undesirable side effect of a vasodepressor agent 
used in the management of hypertensive states 
complicating pregnancy.

The effects of Apresoline, veratum preparations 
including Protoveratrine, Verenateal and IN-66 
(from veratum viride), high spinal anesthesia and 
Arfonad were investigated. Renal plasma flow, 
glomerular filtration rate and renal vascular resis-
tance were determined before and after the admin-
istration of these preparations. Apresoline was ad-
ministered as a single intravenous injection of 40 mg. 
The dose of Verenateal was 0.5 cc., of Protovera-
trine 0.05 mg. in 0.5 cc. solution, and of IN-66, 
1 mg. in 0.5 cc. solution. Veratum alkaloids were 
administered intravenously. Arfonad was given by 
continuous intravenous infusion at rates varying 
from 6 to 16 mg. per minute. High spinal anesthe-
thesias to levels between the fourth cervical and 
second thoracic segments was induced in three 
patients with essential hypertension and three with 
toxemia.

As the result of this study, the authors found that 
Apresoline uniformly lowered the renal vascular 
resistance and blood pressure in cases of toxemia 
and essential hypertension. Neither Arfonad nor 
high spinal anesthesia was effective in the lowering 
of renal vascular resistance. In the case of the ver-
atum compounds, the present data indicated that 
there is a tendency for renal vascular resistance to 
increase following the administration of a crude 
extract or of two pure alkaloids to pregnant patients 
with hypertension, but, since observations were not 
extended beyond one hour after drug administra-
tion, information is not available on whether re-
laxation of renal vascular tone ultimately occurs.

Previous studies have indicated that the initial 
renal vasoconstriction occurring with the veratum 
alkaloids disappeared after about one hour, renal 
blood flow tending to return to normal or super-
normal levels, even while hypotension persisted.

Ehrlich, A., Brodoff, B. N., Rubin, I. L., and Berkm-
an, J. I.: Malignant Hypertension in a Patient 

A case of malignant hypertension of short dura-
tion in a young woman with a documented history of 
normotension is reported with autopsy findings. 
A thrombotic aortic plaque with extensions into 
the main renal arteries, antedating the onset of 
hypertension, was superimposed upon a mesoartitis 
of unknown cause. The sudden complete occlusion of 
a renal artery was related in time to the onset of
malignant hypertension. The duration of the malignant hypertension was correlated with the age of the renal arterial occlusion. Arteriolonecrosis of the nonischemic kidney, brain, adrenal glands, and aorta was found. The vessels of the kidney with a completely occluded renal artery were not remarkable.

BERNSTEIN


This article describes the usefulness of Protonveratrine in the control and treatment of eclamptic toxemia as well as essential hypertension during pregnancy. Ten cases of severe preeclampsia, six of eclampsia, and one of severe essential hypertension are described. The author prefers the subcutaneous route in using Protonveratrine. The dose is determined by weight. The effective dose may be repeated at 8 to 12 hour intervals as needed. Excessive bradycardia is overcome by atropine and excessive hypotension can be overcome by a variety of pressor amines. Prompt control of headaches, scotomas, epigastric pain, convulsions and blood pressure elevation was obtained in these patients.

KITCHELL


A veratrum derivative (Veriloid) was given intravenously to six children in the hypertensive phase of acute nephritis. The drug was administered in two phases: an initial, rapid infusion followed by a slow intravenous drip continued for from 9 to 22 hours. In all instances there was prompt remission of hypertension and associated complications (encephalopathy, convulsions, cardiac enlargement, anasarca and pulmonary edema). The renal and cardiac status was not affected unfavorably by treatment. The patients all appeared well and normotensive after a minimal follow-up period of 2 years. Detailed case histories are presented.

MAXWELL


Six dogs, made hypertensive by the Goldblatt method, showed a gradual drop in the blood pressure toward the normal, or down to a normal level, after obstruction of the common bile duct was established. The dogs were in good general condition and sufficiently fed when these falls were observed. In one hypertensive dog a sham operation upon the common bile duct did not affect the blood pressure, whereas a subsequent procedure at which the common bile duct was obstructed was followed by a gradual fall of the pressure to normal levels. Obstruction of the common bile duct did not affect the blood pressure in one normotensive dog. The cause of the fall in blood pressure in these dogs is unknown. It is suggested that the biliary obstruction may reduce the formation in the liver of a substance which is necessary for the occurrence of hypertension, such as hypertensinogen, or that the hepatic injury may result in an increased production of a substance such as the vasodepressor material of Shorr (VDM), which reduces the contraction of the arterioles.

ROSENBAUM


The effect of a single intramuscular dose of 0.33 mg. of Hydergine was observed in 34 hypertensive patients. A fall of 25/10 or more in the blood pressure occurred in 14 patients, with only a slight effect in 12 others, and no response in eight patients. Hydergine was less effective than hexamethonium in the same patients, particularly so far as the diastolic pressure was concerned. The fall in pressure occurred after a lapse of 10 to 15 minutes and lasted for one to two hours. Oral therapy with Hydergine was observed in 18 patients who showed some response to the parenteral medication. A slight reduction in the blood pressure was seen in only three cases and in none was there significant improvement in the electrocardiographic or retinal changes. The response to sublingual tablets of Hydergine in six patients was no more impressive than that to oral therapy.

ROSENBAUM


The results of treating 172 hypertensive patients during the past 13 years with total thoracic and partial to total lumbar sympathectomy, splanchnicectomy and celiac ganglionectomy are reviewed. The operative technic and the postoperative management are discussed. Nineteen patients were operated upon between June, 1940, and June, 1943. There were three operative deaths. Seven patients died during the tenth to thirteenth year follow-up period and nine are living. Of these nine there is a significant blood pressure reduction in six. Each of these nine patients is working with little or no disability. Ninety-five patients were operated upon between June 1943, and June 1948. In this group there was one operative death. Fifteen patients have died during this 5 to 10 year follow-up period and 79 are living. The five year survival rate of this
ABSTRACTS

group was 85 per cent. Significant blood pressure reduction has persisted in 52 patients or (65.8) per cent. In the remaining 27 patients (34.2 per cent), there has been no reduction in blood pressure. Fifty-eight patients have been operated upon since June 1948. In this group there were two operative deaths, and four have died during the follow-up period (one to five years). Significant blood pressure reduction persists in 39 (75 per cent) and was not found in 21 (40.4 per cent). Of the total group of 172 operated patients 140 are now living (81.4 per cent).

An examination was made of the preoperative condition of the patients who died within three years after operation. The operation in these patients is considered to have been a failure. The conventional operative contraindications have usually been considered to be uremic encephalopathy with markedly increased intracranial pressure, serious myocardial infarction, congestive heart failure, age over 50, and marked neurosis. The preoperative condition of this group of patients varied considerably but showed advanced arteriographic vascular disease. This condition cannot be considered as a definite contraindication to operation, since some of the surviving patients exhibited similar findings. Such findings, however, do indicate a poor prognosis.

The survival rate in this series (84.5 per cent at five years, 84.2 per cent at 5 to 10 years, and 56.2 per cent at ten to thirteen years) is better than the reported follow-up studies of hypertensive patients who were not treated surgically and patients who were treated with splanchnicectomy.

SAGALL

PATHOLOGIC PHYSIOLOGY


There is a direct proportion between the force exerted on a strain gauge arch and the amplitude of oscillographic records obtained. Using such instruments any given area of the ventricular myocardium was shown to be a sample of changes in the whole myocardium. Tachycardia was accompanied by only very small changes in contractile force. L-arterenol produced definite increments in force. When augmentor nerves were stimulated both rate and force were increased in parallel fashion. Increase in initial length by 30 per cent also increased force. Beyond this amount there was no increment in force from further increase in length. Fast saline infusions had little effect.

OPPENHEIMER


Estimated hepatic blood flow was decreased to from 40 to 81 per cent of control values immediately after hemorrhage. Renal blood flow was reduced at the same time. Both parameters returned toward normal within 23 to 70 minutes. Bromosulphalein extraction and arterial hepatic vein oxygen difference increased in the period following hemorrhage.


The left auricular pressure curve was recorded by means of a needle inserted into the left auricle in a case of mitral stenosis with regular sinus rhythm. Cardioangiography was performed and about 60 ml. of contrast medium was injected into the left auricle in less than two seconds, resulting in a first degree atrioventricular block, that is, the atrioventricular conduction time increased from 0.16 second before the injection to a maximum of 0.29 second immediately after the injection. This block lasted for a few minutes. This event made it possible to study the auricular contraction pressure peak without interference with the pressure waves caused by the closure of the atrioventricular valve and the systolic downward movement of the atrioventricular plane. The contrasting curves are illustrated.

RINZLER


A pressure recorded through a catheter wedged tightly in a small pulmonary artery has been referred to as a “capillary,” “venous,” or “wedge” pressure. It was the purpose of this study to determine the significance of pressures obtained through a catheter wedged in a small pulmonary artery.

The pulmonary arterial wedge pressure was approximately equal to the left atrial pressure and it is not a measurement of the pressure in the capillaries in which the flow of blood has not been interrupted. The pulmonary venous wedge pressure was approximately equal to the pulmonary arterial trunk pressure and likewise was not a measurement of the pulmonary capillary pressure.

The difference in pressure between the pulmonary arterial trunk and pulmonary arterial wedge pressures was approximately equal to the pressure gradient across the entire lesser circulation and was employed in the calculation of the total pulmonary vascular resistance. The contour of the arterial wedge tracing did not reflect the contour of the left atrial tracing.
Particular attention should be taken in right heart catheterization to obtain an arterial wedge pressure which is accurate if pulmonary resistance or valve areas are to be calculated.

MINTZ


A group of 20 consecutive patients with auricular fibrillation were examined for evidence of the hyperactive carotid sinus reflex with electrocardiographic records obtained during the period of carotid stimulation. In seven patients evidence of a cardio-inhibitory type of reflex was obtained. Three of these, each with a history of syncope, manifested ventricular standstill. In the other four, there was an abrupt slowing of the ventricular response which became regular. The ventricular complexes showed interesting changes with the transient abolition of a complete left bundle-branch block of nine years duration in one case, and an increasing amplitude of the QRS in two cases. The auricular complexes appeared unchanged. It was presumed that the predominant effect of carotid sinus pressure in these individuals was on the atrioventricular node. The hypersensitive carotid sinus is at least as common in patients with auricular fibrillation as in those with sinus rhythm.

SHUMAN


A 50 year old man with premature ventricular beats and short paroxysms of ventricular tachycardia following an acute myocardial infarction was treated with quinidine sulfate which on three occasions resulted in cessation of sinoauricular control of the heart beat and the development of atrioventricular nodal rhythm. On the first two occasions, the patient was also receiving Benadryl and procaine amide hydrochloride when the nodal rhythm occurred. The third occurrence of the nodal rhythm was on the thirty-sixth hospital day. This was 10 days after the last dose of Benadryl, four days after the last dose of procaine amide and four hours and ten minutes after the last dose of quinidine. The plasma quinidine content at this time was 3.9 mg. per liter. The quinidine dosage on the day previous had been 0.6 Gm. every four hours.

Return to sinoauricular rhythm occurred within 55 minutes, 4 hours and 15 minutes, and 40 minutes on the three occasions.

RINZLER


The authors studied the venous pathways of the arm, neck and chest of 52 young men with normal cardiovascular systems. By obtaining venograms before and during a Valsalva maneuver. During the Valsalva maneuver the radiopaque substance was frequently arrested at the level of the first rib; venograms were obtained which fulfilled the criteria for the diagnosis of venous occlusion of the axillary or subclavian vein; and a retrograde flow of radiopaque substance occurred around the shoulder joint and into the veins of the neck. In the course of diagnostic venography unintentional Valsalva maneuvers should be avoided since a venogram under these conditions might exhibit the features of venous occlusion in the presence of a normal venous system. The importance of arrest of blood flow and increased venous pressure at the level of the first rib during the Valsalva maneuver is discussed as one of the factors which might contribute to the occurrence of axillary or subclavian vein thrombosis during effort.

HARRIS


The author presents three cases of transient cardiac arrhythmia induced by nonpenetrating trauma to the chest. In two men, aged 29 and 32 years, there was no antecedent cardiac history and the arrhythmias consisted of an auricular fibrillation with occasional ventricular extrasystoles and a supraventricular tachycardia, respectively. The third patient, a 62 year old man with asymptomatic arteriosclerotic heart disease, had frequent auricular extrasystoles. The author believes that the transient arrhythmias may be due to contusion of the right auricle in the region of the conduction system, occasioned by compression of the heart against the liver at the right pericardiophragmatic angle.

RINZLER


In this study the oxygen and carbon dioxide partial pressures were determined in blood from the systemic circulation and from the pulmonary capillaries obtained by catheterization in 16 patients with various diseases of the heart and lungs. The pO2 was higher in the pulmonary capillary blood than in the arterial blood, the mean difference amounting to 27.0 ± 3.0 mm. Hg. This difference between pO2 in pulmonary capillary blood and in arterial blood was greater in that group of cases with low arterial pO2 with a correlation coefficient
ABSTRACTS

of -0.86 and a corresponding regression coefficient of -0.72. The pCO₂ was lower in pulmonary capillary blood than in the arterial blood but there was no correlation with the level of the arterial pO₂. It is suggested that study of the pO₂ and pCO₂ differences between pulmonary capillary and systemic arterial blood may be useful as a basis for a method of estimating the diffusion constant between the alveoli and the pulmonary capillaries.

ROSENBAUM


The purpose of this paper is to encourage each surgical and anesthetic department, regardless of size or location, to develop together their skills in the dog laboratories for the prevention, recognition and treatment of the emergency of cardiac arrest. Various methods of producing obstruction to the free exchange of oxygen can then be tried, showing how easily and rapidly cyanosis and cardiac irregularities develop. When the tracheal catheter is completely occluded, the heart rate speeds up, cyanosis develops, and the heart dilates and slows. If, at this time, the airway is opened and oxygen is delivered to the lungs, a rather dramatic change is seen. The heart receives oxygen, and at once renews its work with great vigor; cyanosis clears and the heart size returns to normal.

The importance of this open airway and of oxygen to the cyanotic, dilated heart which is at the point of arrest can be beautifully shown in the dog laboratory to all members of the team involved in treating cardiac arrest.

DENNISON


In the beginning, during intravenous injection of Neo-Synephrine, there is an increase in cardiac, pulmonary and systemic pressures which is not maintained as the infusion continues. Cardiac effects were irregular and did not follow a set pattern. When pressure was high, respiration was depressed. Hematocris, oxygen capacity and A-V differences in oxygen content were increased. There was a decrease in carbon dioxide content.

OPPENHEIMER


It has previously been shown that water diuresis may follow the ingestion of isotonic saline solution by normally hydrated recumbent subjects. Since the position of the patient affects diuresis, a study was performed in healthy adult males. Under the conditions of this experiment, the ingestion of one or two liters of 0.9 per cent saline solution by seated subjects was not followed by water diuresis if the patients were normally hydrated. If the subjects had ingested excess salt on the preceding day, ingestion of a liter of saline solution was followed by prompt water diuresis. This did not occur regularly if the patients were moderately hydropenic. In one instance, when diuresis was observed, it was associated with a decreased electrolyte concentration in the urine and a decreased creatinine U/P (urine/plasma) ratio. When this type of diuretic response follows the administration of water or hypotonic solutions, it is presumed to be due to a diminished secretion of antidiuretic hormone. Since no other mechanism is known which precisely causes this type of diuresis, the hypothesis that the water diuresis is mediated through the supraopticohypophyseal system is reasonable.

WAIFE


Detailed metabolic studies of the effect of pitressin tannate in oil were carried out in normal man. This long-acting posterior pituitary extract produced in normally hydrated subjects prompt water retention, dilution of serum, and a marked increase in the excretion of urinary sodium and chloride. Cessation of pitressin administration was followed by a large diuresis with loss of body weight, a return of the serum concentrations to control levels, and a decrease in the urinary sodium and chloride excretion to below control levels. Since these changes were prevented by restricting fluid during pitressin administration, it would appear that the increased excretion of sodium and chloride is the result of water retention and not a direct effect of the hormone itself. The renal loss of sodium and chloride is interpreted as a homeostatic response to over-expansion of fluid volume induced by pitressin.

WAIFE


The authors studied 51 individuals with mitral stenosis, 35 of whom had aortic valvular disease and 10 mitral incompetence to determine if significant pulmonary arterial changes seen by angiocardiology could be detected on plain films and where these changes were proportional to the pulmonary arterial pressure.

Most of the changes seen on angiocardiology were seen on the conventional films. These changes were divided into three groups that corresponded to
(1) pulmonary pressure less than 40 mm. mercury which produced no changes in the film, (2) pressures between 40 to 70 mm. mercury which produced narrowing and irregularity of the basal vessels and (3) pressure greater than 70 mm. mercury which produced wide spread changes in the pulmonary blood vessels.

These arterial changes are regarded as one of the indications for valvotomy.

SOLOFF


Data on two normal subjects emphasize again the high ability of the organism to conserve sodium by tubular reabsorption of nearly all of it contained in the glomerular filtrate when only minimal amounts of sodium are ingested.

After this condition had been instituted in one of the normal subjects by sharp restriction of dietary sodium, chloride was administered, whose urinary excretion requires a nearly equivalent appearance of total base in the urine; less than one-fifth of the base requirement was supplied as sodium. During a second period of ammonium chloride administration, while the sodium intake was still restricted, the urinary sodium was even less. In another healthy subject, following a regimen that caused a marked and rapid depletion of body sodium, the contribution of sodium accompanying the increased urinary excretion of chloride, administered as ammonium chloride, fell to only 2 per cent.

The edematous nephritic patient reacted to the administered chloride by excreting only 20 per cent of it. This might be explained by the inability of the kidneys to increase production of ammonia and by the small contribution of sodium due to its very efficient reabsorption by the tubules. When tubular reabsorption of sodium was depressed by administration of a mercurial diuretic, the plentiful appearance of sodium in the urine without increase in ammonia was accompanied by a large excretion of chloride.

Studies conducted on an edematous patient with heart disease and on two normal subjects showed that under conditions of water restriction, when body water is forcibly lost through evaporation, the anticipated proportionate loss of sodium through the urine did not occur. On the contrary, calculations show that a large transfer of water from the cells into the extracellular space took place in the normal persons. In the edematous patient with heart disease no such transfer was demonstrated.

These studies indicate that both the patients with nephritis and those with cardiac disease possessed a very efficient mechanism for the renal tubular reabsorption of sodium. Since in both of the patients the volume of the extracellular fluid was excessive, one is led to conclude that the stimulus which resulted in reabsorption of sodium and water had become greatly increased. The mechanism itself in such patients may be normal and the change be merely quantitative.

DENNISON


The author has made extensive observations of blood volume changes in the thorax and abdomen by means of plethysmographic technics and determinations of the air volume in the lungs by means of a Knipping apparatus. These studies of variations in blood distribution were done in humans. It was found that a loss of 25 per cent of the cardiopulmonary blood volume produces no measurable limitation of the respiratory or any impairment of the circulation. Furthermore, it appears that the main blood depot which can be mobilized to offset postural displacements of the blood is held in the lungs and heart. The depot blood in the lungs is considered to be taken up in the peripheral part of the venous system, that is, the veins connecting the capillaries with the larger veins. The volume of the pulmonary reservoir is three times that of the heart. This observer reports that in the intact man, contrary to reports in the experimental animal, the heart rate decreases with the increase in the amount of blood in the lungs and heart, after an initial stage of adaptation, and the heart volume at the end of systole is greater the larger its diastolic volume, indicating that the residual blood volume increases. These observations are felt to indicate that under normal circulatory conditions the heart in man, so far as frequency and stroke volume are concerned, is regulated via the vegetative nervous system. Reserve blood within the lungs is apparently held to be drawn upon to meet rapid circulatory readjustments such as are needed for producing those larger cardiac outputs which occur during physical work. The author expresses the opinion that pulmonary hypertension is not the passive result of insufficiency, but is due to an alteration in the vascular tone caused by a decrease in the stroke volume of the heart.

ROSENBAUM

PATHOLOGY


A total of 22 patients in whom the diagnosis of lupus erythematosus was established by necropsy, by demonstration of the L.E. phenomenon, or by characteristic clinical and laboratory findings was studied for the presence of pulmonary or pleural
disease. In viewing the records of these patients the author has discovered a high incidence of pulmonary involvement in disseminated lupus. Pneumonia was detected in 17 instances, pleural effusions in two, and diffuse pulmonary infiltration in one; two patients had negative findings. Specific lesions such as perivascular changes, interstitial pneumonia or massive effusions were infrequent. The most common manifestation was that of pneumonia of a recurrent or migratory character, either lobar or patchy in distribution. The author concludes that interstitial pneumonia may present predominantly pulmonary manifestations and that patients with recurrent pneumonia, infiltrations or pleurisy should be studied for this disorder.

SHUMAN


Interstitial pneumonia was found to be present in 31 cases of 121 poliomyelitis victims examined at necropsy. In 13 there was evidence of other forms of pneumonia elsewhere within the lungs. Interstitial pneumonia was characterized by a peribronchial and bronchial mucosal infiltration of lymphocytes extending out to the adjacent alveolar walls. Hyaline membranes were not observed in the alveoli. Myocarditis was demonstrated in 24 cases (32.8 per cent) of 73 patients from whom multiple sections of myocardium were available. The inflammatory foci, located in the interventricular septum, papillary muscles, auricular walls and elsewhere, consisted of infiltrations of histocytes, polymorphonuclear leucocytes, lymphocytes with edema and hemorrhages. The possibility of viral etiology of myocarditis, as well as pneumonitis, remains a possibility for which further work is necessary to establish as fact. The pulmonary changes could be produced by aspiration of regurgitated gastric contents.

SHUMAN

OTHER SUBJECTS


The case of a patient with acquired hemolytic anemia and acute disseminated lupus erythematosus is reported. During the course of multiple whole blood transfusion therapy the patient developed three demonstrable atypical serum antibodies—anti-C, anti-A, and another incompletely identified hemagglutinin. These apparently were the agents responsible for her hemolytic disease. Because of increasing intravascular hemolysis, anemia, and renal insufficiency, the patient was given an exchange transfusion, with immediate beneficial results. The ultimate picture was complicated by persistence of the underlying disease and the bizarre serological pattern, which largely precluded blood group compatibility in the course of subsequent transfusions. Certain aspects of serological behavior in relation to this case are discussed.

BERNSTEIN


A theory is presented in this paper to account for the toxemia of pregnancy. Pregnancy, it is claimed, produces a mechanical interference with the renal circulation. If this interference is mild, only hypertension, proteinuria and edema will develop; if severe, coma, convulsions, anuria, uremia and hemorrhage will supervene. Therapy aimed at removing the interference with the renal circulation is recommended.

WESSLER


Based on clinical observation of between 200 and 300 cases of congestive failure of varying degree, the authors believe that sulfonic acid resins are better tolerated by the patients than are the carboxylic acid resins. The ammonium form is not usually objectionable. Fecal impactions are easily avoided but occasionally occur. With doses ranging from two to five ounces of resins daily over prolonged periods no untoward symptoms have been encountered. There have been no cases of potassium deficiency nor of vitamin deficiency. One case of clinically apparent acidosis was encountered in a patient with advanced nephritis. Only three patients stubbornly refused to take the resin. In a few it was discontinued as a matter of choice. The majority of patients were maintained on a low sodium regimen and most received periodic injections of mercurial diuretics. The low salt syndrome did not occur in any of these cases.

Success with the clinical use of cation exchange resins depends to a great extent on the astuteness of the physician, his familiarity with the principles of fluid and electrolyte balance, and his awareness of the pathologic physiology underlying the disease which he is treating.

BERNSTEIN


The results obtained with the blood sera of 50 pregnant women indicate that in the course of pregnancy there is a progressive increase in the enzymatic activity responsible for the destruction of the antidiuretic properties of vasopressin. In the last week of pregnancy 0.1 ml. of blood serum destroys
300 to 350 mU of vasopressin in the course of 40 to 50 minutes, whereas the same amount of blood serum of a nonpregnant woman inactivates only 30 to 55 mU in 960 minutes.

The "antidiuretasic activity" (activity responsible for the destruction of the antidiuretic properties of vasopressin) rapidly decreases in the postpartum period and reaches the values preceding pregnancy five or six days after delivery.

Mintz


In surveys of large numbers of persons for pulmonary tuberculosis it has been noted that many cardiac as well as pulmonary abnormalities were found, and, as a result, it has been recommended that the microfilms be used for surveys for the detection of heart disease. The paper discusses the incidence of heart disease in 682 persons having chest microfilms. On subsequent clinical investigation 56 of these patients had evidence of heart disease, but only 25 of the 56 with heart disease were noted as having abnormal hearts on the microfilms. Twelve persons who were thought to have abnormal cardiac silhouettes did not prove to have heart disease on clinical study. Because of this low degree of detection, the microfilm is therefore not recommended for use in large surveys for finding persons with heart disease.

Kitchell


Pathologic evidence of cardiac involvement in cases of malignant lymphoma is not uncommon. Clinical reports describing this involvement are few. When cardiac abnormalities are the presenting feature of a lymphoma the diagnosis is difficult, but when they occur in patients known to be suffering from the disease, the possibility of their neoplastic origin always should be considered. The two commonest clinical pictures are that of intractable congestive cardiac failure and that resulting from a pericardial effusion. Treatment by irradiation has proved disappointing.

Three cases are described. In one, wherein the patient presented intractable congestive failure due to reticulosarcoma, the diagnosis was made by biopsy of a skin nodule. The tumor was highly radiosensitive, but treatment was unsuccessful. In the second case, pericarditis with effusion developed in the course of Hodgkin's disease, and in the third there was a complicated picture of hypertension and pericardial fibrosis which gave rise to congestive failure in the terminal stages of the disease.

Bernstein


The authors present five cases of peripheral arterial embolism in which aortography accurately localized the block. They conclude that the technic provides a practical, safe and rapid means of establishing the diagnosis.

Wessler


In discussing the acute episodes of cerebral hypoxia such as those which accompany cardiac standstill and other cardiac accidents during operation, the authors emphasize the vicious cycle of hypoxia and edema which is likely to develop in the brain and the hypoxia-potentiating effects of edema. They recommend dehydration by concentrated glucose solution, half- or quarter-reconstituted dried plasma, or concentrated human albumin. They present the case of a patient in coma following cardiac standstill and resuscitation who several times regained consciousness promptly although briefly when injections of 50 per cent glucose were given.

McKusick
ABSTRACTS

Circulation. 1954;10:133-150
doi: 10.1161/01.CIR.10.1.133

Circulation is published by the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231
Copyright © 1954 American Heart Association, Inc. All rights reserved.
Print ISSN: 0009-7322. Online ISSN: 1524-4539

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/10/1/133.citation

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Circulation can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Circulation is online at:
http://circ.ahajournals.org//subscriptions/