Abstracts

Introductory Comment

Beginning with this issue abstracts of articles dealing with or related to cerebrovascular disease will be printed in Stroke—A Journal of Cerebral Circulation. In recent years the increase in the number of articles dealing with various aspects of cerebrovascular disease has made it difficult and time consuming for interested persons to keep current with the literature. A decade ago the Joint Council Subcommittee on Cerebrovascular Disease of what was then the National Institute of Neurological Diseases and Blindness and the National Heart Institute arranged for the regular production of a "Cerebrovascular Bibliography" by personnel in the National Library of Medicine. These Institutes are now called the National Institute of Neurological Diseases and Stroke and the National Heart and Lung Institute; the "Cerebrovascular Bibliography" is issued every three months and "is being distributed during its developmental period to a limited number of investigators, teachers and libraries."

Another series of aids to the wide community of medical personnel dealing with cerebrovascular disease has been the three issues (most recent July 1970) of a "Cerebrovascular Survey Report" which have been prepared for the same Subcommittee with the air of grants from the National Institute of Neurological Diseases and Stroke and the National Heart and Lung Institute. Each issue has reviewed the current status of various topics that relate to cerebrovascular disease and has included an appropriate bibliography to aid the reader in finding original material.

In 1966 Dr. R. G. Siekert, Mayo Clinic, Rochester, Minnesota, began an experimental "Cerebrovascular Information Service" which included making regularly available abstracts of pertinent articles from more than 350 medical journals. This activity is made possible by support from the National Institute of Neurological Diseases and Stroke. As a service to the reader, arrangements have been made with Dr. Siekert for selected abstracts to be printed in each issue of Stroke—A Journal of Cerebral Circulation. (Each abstract is numbered for convenience with the key: ABSTRACT-No. 1-1971.)

AB-1-71

On the basis of the present and previous studies on platelet-collagen interaction, the authors conclude that the surface required for the initiation of platelet aggregation consists of a molecule of specific size which contains rigidly spaced polar active sites, which may be positive or negative with respect to platelet aggregation. Forty percent of the available e-amino groups of lysine, probably located in the polar segments of the central portion of the collagen molecule, appear to be the critical changed sites in human skin collagen. Adhesion of platelets to collagen fibers can be prevented by blocking or replacement of these sites by neutral apolar groups, thereby inhibiting the process of platelet aggregation.

AB-2-71

No mortality due to fat embolism was noted in an uncontrolled series of patients treated with steroid therapy. The dosages used were 125 mg of methylprednisolone sodium succinate (Solu-Medrol®) given intravenously at the time of diagnosis and 80 mg every six hours thereafter for a three-day period. Steroids are then stopped without tapering off. These results suggest that steroids might be advantageous in the treatment of fat embolism.

AB-3-71

Specimens from 961 autopsy cases were studied for the location and distribution of atherosclerotic lesions. Fatty streaks and fibrous plaques are noted to have the same arterial pattern of distribution at all ages. It is felt that fibrous
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plaques are derived from fatty streaks. Since the early atherosclerotic lesions are found to be located at the same sites where stenotic and occlusive lesions have been noted, it is felt likely that the early atherosclerotic lesions and late stenotic or occlusive lesions are pathogenetically closely associated with one another.

AB-4-71
VEDA I: The Effects of Volatile General Anesthetics on Adenosine-Diphosphate-Induced Platelet Aggregation. Anesthesiology 34:405-408 (May) 1971

Volatile anesthetics were found capable of inhibiting platelet aggregation induced by ADP in canine platelet-rich plasma. Platelet aggregation was inhibited 50% at pressures closely approximating those used clinically for methoxyflurane, halothane, diethyl ether, cyclopropane and, to a lesser extent, nitrous oxide.

AB-5-71

Thirty patients with various arterial disorders were studied with a Doppler ultrasonic flowmeter and an impedance cardiograph.

The Doppler flowmeter proved itself to be more sensitive and easier to use, although only the impedance cardiograph has the potential for providing one with information on total blood flow. This device, however, lacks sensitivity in low (less than 10 ml/min) flow states. In five cases which were presented the instruments were able to provide significant information not otherwise obtainable at the bedside, which ultimately altered the clinical management of the patients.

AB-6-71

It is suggested that a battery of simple and widely available laboratory tests may be helpful in the antemortem diagnosis of DIC. The platelet count would detect the thrombocytopenia that is uniformly present. The Quick one-stage prothrombin time would serve as a measure of factors I, II, and V (which are decreased). A Wright stain of the peripheral blood would enable one to detect the characteristic erythrocyte fragments of shistocytes and the partial thromboplastin time test would provide information on deficiencies in the intrinsic clotting system as well as factors VIII, I, II and V. The utilization of these simple laboratory tests might lead to earlier recognition of this disorder and institution of heparin anticoagulation when indicated.

AB-7-71
NISHIZAWA EE, MUSTARD JF: The Effect of Synthetic Phosphatidyl Serines on Platelet Aggregation, Blood Coagulation and Haemostasis. Brit J Haematology 20:45-54 (Jan) 1971

A series of synthetic phosphatidyl serines were studied to observe the effects of these compounds on blood coagulation, platelet aggregation, the formation of haemostatic plugs and deposit formation in extracorporeal shunts. Platelet aggregation induced by collagen, thrombin or antigen-antibody complexes were not inhibited by the in vitro action of phosphatidyl serine with C16 fatty acids, while blood coagulation was inhibited. It would appear that the fatty acid composition of the phosphatidyl serines determines their effects on platelet aggregation and blood coagulation.

AB-8-71

In more than 50% of patients treated with Furosemide there was a significant lowering of both systolic and diastolic pressures from pretreatment levels. Hyperuricemia developed in 31 of 44 patients, but no clinically important side effects or significant disturbances in electrolyte balance were noted. Statistical analysis of the combined data suggests that Furosemide appears to be an effective agent for the treatment of mild to moderate hypertension and has an effect similar to that of other widely used sulfonamide diuretics.

AB-9-71
RASKIND R, WEISS SR: Arteriovenous Malformations: Follow-up in 68 Cases. Vase Surg 5:30-35 (Jan-Feb) 1971

Follow-up data were obtained in 68 patients with arteriovenous malformations of the brain. Nineteen patients (28%) were treated by total excision of the lesion. One of the surgically treated patients died (5.3%). Permanent serious postoperative residua were noted in six patients. In the non-operated group the mortality was 6.1% and severe complications were noted in five patients. Two of nine pregnant women bled from the intracranial lesion during the second trimester and were treated surgically. All patients delivered normal children at term. It is concluded that total surgical removal, when feasible, is the optimal treatment.

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AB-10-71

Carbon dioxide is significantly more soluble in plasma than in air or oxygen and this property allows CO\textsubscript{2} to be used for obtaining systemic arteriograms. In spite of the dangers in using this technique in patients with impaired CO\textsubscript{2} excretion, it has been employed for the visualization of various organs including the brain. The present work, carried out in dogs, reports experience in visualizing the wall of the renal arteries.

AB-11-71
WISE GR, FARMER TW: Bacterial Cerebral Vasculitis. Neurology 21:195-200 (Feb) 1971

Ten febrile patients presented with the sudden onset of focal cerebral ischemia or infarction felt to be caused by cerebral vasculitis. The histories revealed the presence of an acute bacterial infection of the paranasal sinuses or middle ear. The characteristic CSF findings of a diffuse pyogenic leptomeningitis were not present. Radioisotope scanning was utilized to localize the cerebral abnormality and cerebral angiography was felt necessary to exclude subdural empyema or brain abscess. Two patients had angiographic evidence suggesting cerebral thrombophlebitis, and findings of cerebral arteritis were noted in an additional two patients. Adequate antibiotic therapy utilized in combination with appropriate surgical drainage resulted in cure of 90% of the patients.

AB-12-71

The authors present evidence which suggests that antifibrinolytic drug therapy may be beneficial in preserving the size and strength of a thrombus in a recently hemorrhaged saccular aneurysm. By ligating the abdominal aorta of rats an arterial sac was created. The thrombus in rats treated with 5% epsilon aminocaproic acid (EACA) was able to resist an intra-aortic pressure 2.5 times as great as in untreated controls, although clot size remained unchanged. Rats treated with 1%, 2.5% and 5% tranexamic acid (trans-AMCHA) showed progressive increase in clot size and in the latter concentration were able to resist intra-aortic pressures eight times that noted in the control animals.

AB-13-71

Neuropathological studies in two patients with asymptomatic disease of the aorta revealed selective gray matter infarction in the lumbar and sacral cords. The unique association between asymptomatic aortic disease and the clinicopathologic findings in these cases are reviewed. The authors conclude that further neuropathologic studies are needed.

AB-14-71

Twenty-seven patients with acute pulmonary embolism were divided into two groups: the first receiving heparin alone and the second heparin and streptokinase. The extent of early resolution observed angiographically was compared in the two groups. Seventy percent of the patients not treated with streptokinase showed no angiographic change while 14 of 17 patients treated with both drugs showed varying degrees of improvement. It is suggested that combined heparin-streptokinase therapy accelerates thrombolysis in patients with major pulmonary embolism.

AB-15-71

Prospective studies of mean arterial pulse pressure and systolic pressure lability were carried out in 5,127 men and women during 14 years of biennial examination. The data reveal that the level of a casually obtained blood pressure was a good predictor of coronary heart disease, and the risk appears proportional to the height of the elevation. In those patients under the age of 45 years diastolic pressure elevation indicated a stronger association with risk of coronary heart disease. As patient age increased there was a corresponding increase in the importance of systolic pressure; it would appear that the commonly held view regarding the innocuous nature of an elevated systolic pressure in the elderly needs reassessment.

AB-16-71

The value of angiography was studied in 104 consecutive cases of ischemic episodes in the
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Five hundred patients with various forms of cerebral vascular disease were studied prospectively for a mean period of 4.6 years. A subsequent stroke developed in 94 of the 151 patients presenting with cerebral vascular insufficiency. Of 349 patients presenting with a stroke, 164 had no further episode of cerebral vascular disease, while the remainder had recurring difficulty which in 76.8% occurred within three years of the onset of the disease. Recurrent stroke episodes were associated with the worst prognosis for survival while survival rates for transient vascular insufficiency uncomplicated by stroke were similar to those of the normal population.

ACHESON J: Factors Affecting the Natural History of “Focal Cerebral Vascular Disease.” Quart J Med (New Series) 40:25-26 (Jan) 1971

In a group of 500 patients with cerebral vascular disease it was noted that there was a significant association between the presence of elevated diastolic blood pressure, a history of recurring stroke episodes and increased morbidity and mortality. Such factors as the evolution of the stroke, the serum cholesterol level, the existence of associated peripheral vascular disease, diabetes mellitus, head trauma and onset during sleep had no apparent relevance to changes in natural history. The site of the vascular lesion, the temporal pattern of vascular involvement, and the incidence of transient ischemic symptoms in patients with a history of repeated strokes was also studied and found to be significant, although the explanation for these observations was uncertain. Although varying as to type of abnormality, an abnormal ECG was commonly associated with an adverse prognosis.


Cat brains rendered ischemic by interrupting the arterial blood supply were then perfused with various saline solutions prior to restoring the circulation. The results were compared to a control group which was not perfused. Direct observation of the pial vessels suggested that the post-ischemic circulation was considerably improved in the perfused group and the functional status of neuronal activity of the perfused animals as assessed by recording the EEG and the pyramidal response after electrical stimulation of the motor cortex recovered after ischemia of much longer duration. The perfused animals also failed to show the severe structural alterations noted in capillaries, neurons and glial cells noted in the nonperfused animals. It is postulated that elimination of the metabolic waste products reduces tissue damage during ischemia and the improvement in the post-ischemic circulation helped to prevent secondary ischemic lesions.

ACHESON J: The Natural History of “Focal Cerebral Vascular Disease.” Quart J Med (New Series) 40:15-23 (Jan) 1971

Twelve patients with chronic and recurring cardiovascular syncope and one patient with transient syncope following a myocardial infarct...
ABSTRACTS

are presented. Two mechanisms of cardiac slowing were noted. Six patients displayed severe sino-atrial block and bradycardia, while the remaining seven patients experienced periods of bradycardia and tachycardia with asystole and syncope occurring at the end of the tachycardia. Eleven patients had successful implantation of a ventricular demand pacemaker with relief of symptoms.

AB-22-71

Twelve healthy adult males were given a single dose of 650 mg of aspirin and its effect on thrombus formation time (TFT) and prothrombin time (PT) was measured. An improved Chandler method producing in vitro thrombosis was used to determine the TFT and the PT was measured with the Quick one-stage method. The PT was not altered by the ingestion of aspirin; however, a substantial increase of the TFT was noted in four subjects. Two subjects had a slight but significant increase while the remaining six showed no notable change. The potential clinical use of aspirin in the treatment of disorders of platelet aggregation is discussed.

AB-23-71

Utilizing the 133Xenon dilution technique (Ingvar and Lassen) cerebral blood flow (CBF) was measured in 11 patients undergoing common carotid artery ligation for the treatment of intracranial aneurysms. Within 30 minutes after clamping, CBF, which had initially declined, had risen to the resting level. At the same time, systemic and distal intravascular blood pressure was measured by means of arterial cannulae. While the systemic blood pressure remained constant there was noted a persistent reduction in the internal carotid artery pressure, thereby theoretically affording protection to the aneurysm. No deterioration in neurologic status was noted while the patients were under observation.

AB-24-71

A single clinician reports his long-term observations upon young men presenting with elevated blood pressure. Excluding those cases with identifiable cause, along with those showing hypertensive damage, there were 40 of 53 men felt definitely to have essential hypertension. Twelve of these men had a gradual fall in diastolic pressure, without treatment, to normotensive levels over an average of 6.7 years. Twenty-eight patients received hypotensive therapy, but in ten of these evidence of vascular complications developed. The author suggests that hypotensive therapy does nothing to prevent, and may provoke, occlusive complication.

AB-25-71

Magnification can substantially aid in cerebral angiographic diagnosis and was found to be of greatest aid in the following situations: (1) symptomatic patients with objective clinical evidence of focal cerebral dysfunction but a normal conventional angiogram; (2) avascular masses; (3) sellar and parasellar masses; (4) suspected posterior fossa lesions; (5) chemodectomas of the temporal bone; (6) lesions located adjacent to, or in, the base of the skull; (7) orbital disease; and (8) cases of temporal arteritis.

AB-26-71

In an accompanying article (Best et al: Graphic analysis of the ocular pulse in carotid occlusion. Arch Ophthal 85:315-319 [Mar] 1971) the technique for plethysmographic studies of the ocular pulse is detailed. Utilizing this method ophthalmodynamometry and ocular pulse studies were employed in rabbits with surgically induced carotid arterial occlusions. The ocular pulse amplitude was found to be more sensitive than ophthalmodynamometry in detecting both acute and chronic occlusions.

AB-27-71

The opacity of tissue to light changes during each cardiac cycle. This change when converted by a photocell to voltage for recording may be utilized to measure various parameters of local circulation. Results of these studies show that in most patients with normal four-vessel and subclavian angiograms, the values obtained by recording over the medial supraorbital areas (i.e., the facial skin supplied by branches of the internal
the observations of red venous blood. Cerebral hyperemia, in regions previously ischemic, may be combined with increased blood flow ("reactive cerebral tissue to utilize available oxygen component") and degree of hyperemia. It appears that failure of blood flow autoregulation and became pressure dependent. Restoration of cortical blood flow studies, and incomplete correlation existed between the degree of preceding ischemia and degree of hyperemia. It appears that failure of cerebral tissue to utilize available oxygen combined with increased blood flow ("reactive hyperemia"), in regions previously ischemic, may account for the "luxury perfusion" manifested by the observations of red venous blood. Cerebral edema was also incompletely correlated with the degree of hyperemia and ischemia and was progressive, increasing even after restoration of cortical blood flow.

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Stimulation of specific regions of the pontine and midbrain reticular formation by the thalamus and the hypothalamus in 25 monkeys consistently caused increases in cerebral blood flow (CBF) and oxygen consumption (CMRO₂). This response was not altered by CO₂ inhalation, hyperventilation or cervical sympathectomy, suggesting that temporary loss of autoregulation occurs during stimulation of these areas. It is concluded that there appear to be centers within the brain which influence CBF and metabolism and these centers may, in part, account for the rapid increase in CBF noted during seizures and REM sleep and the neurogenic loss of autoregulation found in association with certain types of brain injury.


Observations of the cortical blood vessels and studies of the cortical blood flow (¹⁸⁶Kr washout technique) were made in 10 squirrel monkeys subjected to temporary occlusion of the middle cerebral artery. Reductions in cortical blood flow of 20% to 50% of preocclusion values were noted in core areas of ischemia. These areas showed failure of blood flow autoregulation and became pressure dependent. Restoration of cortical blood flow was observed after release of the occluding clip. Poor correlation was noted between the degree of observed vascular reaction and the degree of hyperemia determined by the cortical blood flow studies, and incomplete correlation existed between the degree of preceding ischemia and degree of hyperemia. It appears that failure of cerebral tissue to utilize available oxygen combined with increased blood flow ("reactive hyperemia"), in regions previously ischemic, may account for the "luxury perfusion" manifested by the observations of red venous blood. Cerebral


One group of Rhesus monkeys with an experimental cerebrovascular occlusion was hyperventilated to a PaO₂ of 25 mm for three hours after an initial hour of normocarbia, while in another group normocarbia was maintained. After seven days the animals were sacrificed and the area of infarction was measured. There was no statistical difference noted and it is concluded that delayed hyperventilation does not alter the area of infarct in acute cerebrovascular occlusion.


Fifty-six patients with asymptomatic carotid bruits surgically treated were followed one to six years (average 36 months). The results revealed operative mortality (one) 2%, postoperative stroke (two) 4%, late stroke (two) 4%. Six patients were lost to follow-up, and 34 patients were alive and well. Fifteen patients died during the follow-up period (none from cerebral vascular accident). Twelve died from acute myocardial infarction. The mortality in that group of patients who had multiple risk factors (hypertension, history of myocardial ischemia, more than 65 years of age) was 66%. It is concluded that while carotid endarterectomy in the patient burdened by these risk factors is inadvisable, the operation is
indicated in the younger patient with severe carotid artery stenosis.

**AB-33-71**

Thirty-five embolic episodes were noted in 27 (16%) of 170 patients with prosthetic heart valves receiving anticoagulant therapy and followed for an average of 26 months. Cerebral emboli were predominant (23) followed by coronary emboli (nine) and one instance each of brachial artery and retinal and mesenteric artery embolism. The incidence of thromboembolic episodes did not vary with the type of prosthesis utilized but was significantly lower in the group whose prothrombin time was consistently maintained in a therapeutic range. The presence of atrial fibrillation did not appear to increase the risk of embolism. The tendency for embolic episodes decreased with time and no emboli were noted during the fifth and sixth postoperative year. It would appear that care in the maintenance of anticoagulant therapy is of the utmost importance in preventing thromboembolic complications of heart valve prostheses.

**AB-34-71**

Seventeen of 87 children with acute acquired hemiplegia had primary arterial occlusions. These patients were divided into five groups and the morphological features of each are discussed: (1) basal arterial occlusion without telangiectasia, (2) basal occlusion with telangiectasia, (3) nontraumatic stenosis of the cervical internal carotid artery, (4) primary distal branch occlusion, and (5) small artery disease. Angiography is felt to be indispensable for the diagnosis of arterial occlusion, and is particularly indicated in cases of hemiplegia associated with headache or with subarachnoid hemorrhage.

**AB-35-71**

Calcification of the carotid artery siphon is frequently (75.6%) encountered in the skull x-rays of healthy, elderly males. This calcification can be divided into two types: intimal (71%) and medial (29%). Patients with intimal calcification have cerebral blood flow values of 52.1 ml/100 gm/min, which are lower than those encountered in either healthy normal individuals (57.9 ml/100 gm/min) or in those with medial calcification (60.6 ml/100 gm/min).

**AB-36-71**

Phenoxybenzamine, a long-acting α-adrenergic blocking agent, was injected into the internal carotid artery in 23 patients immediately following surgery for intracranial aneurysm in an attempt to prevent the onset of spasm. In three cases with marked neurological deficit a rapid improvement was noted which was attributed to the action of the drug, and it is postulated that intracarotid phenoxybenzamine may be of value in therapy, providing irreversible infarction of the brain has not occurred. It is cautioned that at the present time the drug is best given only after adequate intracranial surgery because of the potential risk of increased bleeding due to the relaxation of vascular spasm.

**AB-37-71**

Four adult patients with pulmonary, CNS, renal and sinus involvement due to Wegener's granulomatosis were treated with cyclophosphamide. The patients, all previously unresponsive to corticosteroids, showed rapid and sustained improvement in their clinical symptomatology. Two patients were withdrawn from all therapy in 12 to 20 months, while the other two patients have been asymptomatic for three and one-half years on low oral dosage. Although the precise mechanism of action remains unknown, further trials with cyclophosphamide in this potentially fatal disease appear warranted.

**AB-38-71**

Following physical exercise, normal young males, aged normal males and male patients with complications of atherosclerosis all developed a hypercoagulable state of similar intensity. The fibrinolytic response, however, differed in each group; the increase was in the range of 140% in young normal males, 40% in aged normal males, and 20% in patients with atherosclerosis. It is concluded that the homeostatic equilibrium existing between coagulation and fibrinolysis following exercise is reduced in the aged and in the presence of atherosclerosis.
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AB-39-71

Unilateral occlusion of the middle cerebral artery was performed in 14 cats and measurements of cortical blood flow (CBF) as well as observations of the superficial microvasculature were made bilaterally before and after the intravenous injection of various vasoactive drugs. Despite a reduction in the mean systemic arterial blood pressure (MABP), papaverine produced increases in CBF in seven of eight animals. Hexobendine, while also reducing the MABP, produced an increase in CBF in two of six animals. Three animals were given Hydergine and no change in CBF was noted. An increase in CBF in the ischemic hemispheres was not observed with any of the drugs tested and any decreases in CBF noted in the ischemic hemispheres were related to a decrease in MABP and presumed impairment of autoregulation. Three animals showed paradoxical responses to increased CO₂ tension.

AB-40-71
JORGENSEN L, CHANDLER AB, BORCHGREVINK CF: Acute Lesions of Coronary Arteries in Anticoagulant Treated and in Untreated Patients. Atherosclerosis 13:21-44 (Jan-Feb) 1971

In a consecutive autopsy series of 1,567 cases, 78 patients who died within 48 hours after the onset of cardiac ischemia were selected for a study of the nature and frequency of acute lesions in the main coronary arteries. Nineteen patients were on anticoagulant therapy at the time of the fatal episode. The incidence of ruptured plaque and thrombosis of nonruptured plaque were noted with nearly equal frequency among those patients not on anticoagulants, but the incidence of ruptured plaque was higher in the treated group. Although hemorrhage was found in the ruptured plaques of treated patients, the incidence of hemorrhagic enlargement of the plaque was not different in the treated and untreated patients.

AB-41-71

The increase in the level of factors VII and X, found after three months of ingestion of any estrogen-progestogen oral contraceptives, was not noted in a two-year follow-up study of progestogen-only contraception using chloramadione acetate, and the clotting factors which were raised with the combined preparations became normal after the sixth monthly cycle using progestogen. After 12 months of treatment some changes in the thromboelastograph pattern were noted with progestogen, but not to the extent seen with the combined preparations. After 24 months a significant acceleration in platelet aggregation was observed with progestogens, but this was also less than with the combined preparations.

AB-42-71

The incidence of carotid-ophthalmic aneurysm is quite low. The majority of patients are women and in this series multiple aneurysms were seen in 21%. Fifteen patients presented with subarachnoid hemorrhage and four patients had symptoms of intermittent optic nerve or chiasmal compression. Oblique angiograms are necessary to obtain proper evaluation of the aneurysm, and surgical intervention does not appear absolutely necessary in all cases. Ligation of the common carotid is suggested as the treatment of choice.

AB-43-71

Eight children are reported with a characteristic picture consisting of a brief vasomotor prodrome followed by the abrupt onset of hemiplegia and contralateral headache resolving in several hours to days. Radiological investigations are negative and as the children have matured the attacks have become less frequent and more nearly typical of migraine. In several patients convulsions were noted with the onset of the hemiplegia and residual neurological signs and dyskinesia are now present.

AB-44-71

Prothrombin times and plasma warfarin levels were measured in 17 patients receiving oral anticoagulants, during treatment with chloral hydrate, and during a placebo control period. No significant differences were noted and it is concluded that the clinical significance of any
interaction between chloral hydrate and warfarin is negligible.

AB-45-71
PARKES JD, JAMES IM: Electroencephalographic and Cerebral Blood Flow Changes Following Spontaneous Subarachnoid Hemorrhage. Brain 94:69-76 (Jan) 1971

An increase in EEG percent time slow activity relating directly to a reduction in blood flow in both gray and white matter was noted in 17 patients with recent spontaneous subarachnoid hemorrhage. Cerebral arterial spasm correlated well with increasing theta activity. Hemorrhage from a single unilateral aneurysm characteristi-

cally produced bilateral changes in both the EEG and cerebral blood flow.

AB-46-71
SHAH SH, KENDALL B: Elucidation of the Cause of Raised Intracranial Pressure by Angiography With Special Reference to the Deep Venous System. Brit J Radiol 44:245-257 (Apr) 1971

Measurements made during the venous phase of antero-posterior angiograms are shown to closely approximate the values obtained on air study and are of practical value in assessing the size of the body of the lateral ventricle. Lateral views are of some inferential value in differentiating the various causes of hydrocephalus.
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