AB-1287-73
The Effect of $P_{\text{CO}_2}$ on the Metabolism of Ischemic Brain in Squirrel Monkeys—Michenfelder JD, Sundt TM Jr (Mayo Clinic and Mayo Foundation, Rochester, Minnesota 55901)—Anesthesiology 38:445-453 (May) 1973*

Cerebral ATP, lactate, and pyruvate concentrations were measured bilaterally in 21 squirrel monkeys two hours after occlusion of the right middle cerebral artery (MCA). All animals were mechanically hyperventilated beginning 30 minutes after MCA occlusion. Effects of addition of various concentrations of CO$_2$ to inspired gases were studied in three groups (seven animals in each): (1) hypocapnic ($P_{\text{CO}_2} = 20$ mm Hg); (2) normocapnic ($P_{\text{CO}_2} = 40$ mm Hg); (3) hypercapnic ($P_{\text{CO}_2} = 60$ mm Hg). Results in these animals were compared with those obtained in six monkeys breathing room air spontaneously during the two-hour occlusion period ($P_{\text{CO}_2} \approx 30$ mm Hg). In the hypocapnic animals, cerebral ATP was significantly less and cerebral lactate significantly greater than corresponding values in the hypercapnic and spontaneously breathing monkeys. We conclude that hypocapnia induced by mechanical hyperventilation does not improve, but rather aggravates, the cerebral metabolic effects of ischemia induced by MCA occlusion. Three possible mechanisms are suggested to explain the deleterious effects of hypocapnia: the effect of pH on glycolytic activity, the direct effect of CO$_2$ on cerebral blood flow, and the systemic effects of hypocapnia and mechanical hyperventilation.

AB-1288-73
The Effect of Glycerol and Intracarotid Phenoxybenzamine After Experimental Subarachnoid Hemorrhage. An Ultrastructural Study—Dodson RF (Department of Neurology, Baylor College of Medicine, Texas Medical Center, Houston, Texas 77025), Hashi K, Meyer IS—Acta Neuropath (Berlin) 24:1-11, 1973 (Springer-Verlag, publisher)*

Twenty-four hours and one week, respectively, after subarachnoid hemorrhage (SAH) had been experimentally induced in baboons, therapeutic dosages of glycerol and/or phenoxybenzamine hydrochloride were injected intravenously. Groups of three animals were studied at various time intervals after SAH: one animal served as a control, one animal per group received phenoxybenzamine hydrochloride (PBZ), and the final animal received both PBZ and a 10% glycerol (in saline) injection. The animals were prepared for electron microscopy by whole body perfusion with a glutaraldehyde/phosphate fixative. Few ultrastructural abnormalities were noted in cerebral tissue in each of the animals receiving glycerol, whereas the brain tissue from the untreated animals and those which had been treated with PBZ alone showed morphological changes compatible with cerebral edema.

AB-1289-73
Oral Contraception and Increased Risk of Cerebral Ischemia or Thrombosis—Collaborative Group for the Study of Stroke in Young Women (Albert Heyman, M.D., Box 3203, Duke University Medical Center, Durham, North Carolina 27710)—New Eng J Med 288:871-878, 1973*

A case-control study was conducted to determine the relation between the use of oral contraceptives and the occurrence of stroke in young women. During a two-year period between 1969 and 1971, neurologists from 12 university hospitals identified various types of cerebrovascular disease in 598 nonpregnant women 15 to 44 years of age. Control subjects matched for age, sex and race were chosen from the discharge rosters of the same hospitals and from women residing in the same neighborhood as the patients with stroke. A detailed history of contraceptive practices was obtained by lay interviewers from approximately 70% of patients and controls. The current use of oral contraceptives was considerably increased in women with thrombotic strokes as compared with their controls and somewhat increased in women with hemorrhagic strokes. The relative risk of cerebral ischemia or thrombosis was estimated to be about nine times greater for women who use oral contraceptives than for those who do not.

AB-1290-73
Intracranial Hemorrhage, Hypokalemia, and the Electrocardiogram—Hutchinson RG, Haerer AF (Department of Medicine, University of Mississippi Medical Center, Jackson, Mississippi)—Clin Med 80:23-27 (Mar) 1973*

From the results reported here in a large series of patients and a review of the literature, it appears likely that the ischemic, hypokalemic, and other electrocardiographical findings seen in hemorrhagic stroke patients originate not from just one but from multiple causes.

AB-1291-73

Over the years various treatments have been suggested as therapy for cerebral thrombosis or its...
Brain Vascularization by Intact Omentum—Goldsmith HS (Department of Surgery, Jefferson Medical College, Philadelphia, Pennsylvania 19107)—Arch Surg 106:695-698 (May) 1973*

A group of dogs had their intact omentum mobilized to the extent that it could be placed directly upon the surface of the brain. It was subsequently shown, both grossly and histologically, that vascular anastomoses developed between the brain and the omentum and that injected material entered the brain via the vessels at the omental-cerebral interface.

Isolated Homonymous Hemianopia. A Review of 104 Cases—Trobe JD, Lorber ML, Schlezinger NS (Wills Eye Hospital and Research Institute, Philadelphia, Pennsylvania 19130)—Arch Ophthal 89:377-381 (May) 1973*

In a retrospective review of 104 cases of homonymous hemianopia, cerebral infarction was the diagnosis in 89% of the patients. This diagnosis was twice as common as reported in a previous series, which included other neurological findings along with homonymous field defects.

The majority of patients were white and between the ages of 50 and 70 years, often having a history of vascular disease. Eighty-eight percent of the patients showed a static or improved clinical course, while only 12% showed visual field or central nervous system deterioration.

A routine work-up, excluding contrast studies, was sufficient to select 11 out of the 12 cases that were not due to infarction. Data that were suggestive of a noninfarctive cause were patients aged under 40 years, incongruous field defects, abnormal skull x-ray films, abnormal opticokinetic nystagmus, and elevated levels of spinal fluid protein.

**ABSTRACTS**


The mongolian gerbil has an anomalous circle of Willis, lacking a major posterior communicating artery. Fatal cerebral infarction followed unilateral carotid artery ligation in the neck in 60% of the cases studied. This mortality was reduced by large intraperitoneal injections of dexamethasone. Evidence is presented that this reduction in mortality is associated with a significant reduction in cerebral edema in the infarcted hemisphere.

Brain Vascularization by Intact Omentum—Goldsmith HS (Department of Surgery, Jefferson Medical College, Philadelphia, Pennsylvania 19107)—Arch Surg 106:695-698 (May) 1973*

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A routine work-up, excluding contrast studies, was sufficient to select 11 out of the 12 cases that were not due to infarction. Data that were suggestive of a noninfarctive cause were patients aged under 40 years, incongruous field defects, abnormal skull x-ray films, abnormal opticokinetic nystagmus, and elevated levels of spinal fluid protein.

Relative Rates of Arterial Lactate and Oxygen-Deficit Accumulation in Hypoxic Dogs—Cain SM (Departments of Physiology and Biophysics and Pulmonary Division, Department of Medicine, University of Alabama Med-
Two groups of dogs were anesthetized, paralyzed, and made hypoxic by breathing 9% O₂ in N₂ from a constant-volume respirator after a suitable control period at the same ventilation on air. One group received a β-adrenergic blocking agent, propranolol, and the other did not. During the 30-minute hypoxic period, oxygen uptake, arterial lactate, and pyruvate were measured every three minutes. Changes in O₂ stores with time of hypoxia were calculated from blood-gas values of arterial and mixed venous blood. Net curvilinear in an upward direction in the no-β-block group after a suitable control extracorporeal autocerebral perfusion. Ten animals had continued perfusion of cold blood. In ten animals, the ship between intravascular radioactivity and subdural with subdural hematomas was studied by cannulating cumulative NOD. The upward deflection of XL in the linearly with time in the β-block group but was curvilinear in an upward direction in the no-β-block group. XL showed similar relationships as a function of cumulative NOD. The upward deflection of XL in the no-β-block group was evidence of the calorogenic action of catecholamine resulting from hypoxic stimulation of sympathoadrenal responses and causing increased energy demand when aerobic metabolism was limited by O₂ supply.

**AB-1299-73**

Dynamics of Technetium Scanning of Subdural Hematomas—Apfelbaum RI (Departments of Neurological Surgery and Radiology, Albert Einstein College of Medicine, Yeshiva University, Bronx, New York). Newman SA, Zingesser LH—Radiology 107:571-576 (June) 1973*

The accumulation of radioactivity in five patients with subdural hematomas was studied by cannulating the subdural collections following intravenous injection of 99mTc. Samples obtained were paired with samples of peripheral blood in order to demonstrate the relationship between intravascular radioactivity and subdural radioactivity. The data show a maximum ratio between subdural and intravascular radioactivity several hours after the injection of 99mTc. It is suggested that the reported 80% scanning accuracy in patients with subdural hematomas can be increased by delaying scanning until several hours after nuclide administration.

**AB-1300-73**


Monkeys (Macaca mulatta) were subjected to extracorporeal autocerebral perfusion. Ten animals had their brains cooled to 15°C and then maintained between 10° and 15°C for an additional 30 minutes b-continued perfusion of cold blood. In ten animals, the brains were cooled to 15°C and cerebral blood flow was then arrested for 30 minutes. Nine animals were perfused at normal temperatures for one hour as controls. Twenty-three of the 29 animals survived these procedures. Survivors were observed for one week after surgery and revealed no obvious neurological deficits. Subsequent testing on a battery of behavioral tasks showed performance deficits suggestive of brain damage in only two animals, both from the control group. The incidence of death indicates the risk inherent in extracorporeal perfusion of the brain, but the long-term behavioral results found with the survivors demonstrates that profound hypothermia of the brain in and of itself does not have any apparently deleterious effects. Furthermore, the results with the animals subjected to arrest of cerebral blood flow under conditions of profound hypothermia demonstrate the protective effects of cooling against the damage which would otherwise result from ischemia and anoxia.

**AB-1301-73**

Remitting Signs in Cerebral Mass Lesions—Fincham RW, Worrell JB (University of Iowa School of Medicine, Iowa City, Iowa—Amer Family Phys 7:96-100 (June) 1973*

Cerebral tumors can appear with a stroke-like onset, simulating an acute focal cerebral lesion. More commonly, intracerebral mass lesions produce progressive neurological deficits. Less frequently, these lesions can present with truly remittent signs and symptoms of neurological dysfunction, simulating cerebrovascular syndromes. The mechanisms of these intermittent signs are unclear and speculative but physicians must be aware of their occurrence.

**AB-1302-73**

Age-Distribution of Extradural Haemorrhage Without Skull Fracture—Galbraith SL (Division of Neurosurgery, Institute of Neurological Sciences, Glasgow, Scotland)—Lancet 1:1212-1214 (June 2) 1973*

Of 46 cases of extradural hemorrhage without fracture of the skull, 42 (91%) were under the age of 30. Extradural hemorrhage is unlikely to develop in patients with head injuries over the age of 30 without skull fracture, and the rule of admitting all such patients after brief amnesia is probably overcautious and wasteful of hospital beds.

**AB-1303-73**

Cardiac Dysrhythmia and Transient Cerebral Ischaemic Attacks—McAllen PM, Marshall J (Institute of Neurology, Queen Square, London, England)—Lancet 1:1212-1214 (June 2) 1973*

Of 16 patients who required insertion of a permanent cardiac pacemaker to control episodes of dysrhythmia producing transient cerebral ischemic attacks (TIAs) eight had previously been seen elsewhere without the cause of their TIAs being recognized or—in five cases—an electrocardiogram recorded. Of 13 patients treated medically for episodic cardiac dysrhythmia associated with TIAs, in six these attacks had not been
previously recognized. The possibility of a cardiac cause for TIA needs to be appreciated more widely.

AB-1304-73

Surgical Management of the Carotid Sinus Syndrome—Cheng LH, Norris CW (Department of Otolaryngology, University of Kansas Medical Center, Kansas City, Kansas 66103)—Arch Otolaryngol 97:395-398 (May) 1973*

A case of carotid sinus syndrome was managed surgically with gratifying results. The symptoms have not recurred up to 19 months after the operation. The surgical management in the case reported consisted of adventitial stripping of the carotid bifurcation. The detailed surgical technique and rationale for surgical treatment are discussed.

AB-1305-73

Permanent Demand Pacing for Hypersensitive Carotid Sinus Syndrome—Peretz DI (P. A. Woodward Medical Intensive Care and Coronary Care Unit, St. Paul's Hospital, Vancouver 1, B. C.), Gerein AN, Miyagishima RT—Canad Med Assoc J 108:1131-1134 (May 5) 1973*

Ten patients with proved hypersensitivity of one or both carotid sinuses and with symptoms of recurrent lightheaded spells and syncope had implanted a permanent transvenous demand pacemaker. In a follow-up course ranging from 6 to 55 months there has been no recurrence of lightheadedness or syncope in any of the patients. Six of the ten have had their battery packs replaced owing to routine battery exhaustion.

AB-1306-73

Ventriculostomy for the Treatment of Acute Hydrocephalus Following Subarachnoid Hemorrhage—Kuske JA (Neurosurgery Section, Veterans Administration Hospital, Long Beach, California 90801), Turner PT, Ojemann GA, Harris AB—J Neurosurg 38:591-595 (May) 1973*

The role of ventriculostomy in the treatment of acute hydrocephalus following subarachnoid hemorrhage from intracranial aneurysms is evaluated. Eleven patients treated with an external ventricular drain are compared to a matched control series of untreated patients. Improvement occurred in eight of the 11 treated patients and in only one of the nine patients in the control group. Seven of the patients in the ventriculostomy series improved sufficiently to justify definitive surgery. There were no infections. In 50% of the surviving ventriculostomy patients, permanent shunts were unnecessary. Our data emphasize the deleterious effects of hydrocephalus in the acute period following a subarachnoid hemorrhage and suggest that it may be treated effectively by external ventriculostomy.

AB-1307-73

Warning Signs Prior to Rupture of an Intracranial Aneurysm—Okawara S-H (Division of Neurosurgery, University of Iowa College of Medicine, Iowa City, Iowa)—J Neurosurg 38:575-580 (May) 1973*

Warning signs prior to major hemorrhage were analyzed in 112 cases of single intracranial aneurysm. Fifty-four of 112 patients (48.2%) showed such signs, and the incidence for women was slightly higher (49.2%) than that for men (46.6%). Incidence decreased as patient age advanced, more steeply for men than women. Incidence and characteristics of warning signs varied according to location of aneurysm. Nineteen different signs occurred in 97 instances for 54 patients (average 1.76), and were placed into three groups according to possible etiologies: Group 1, vascular origin due to expansion of aneurysm and adjacent artery; Group 2, minor bleeding; and Group 3, ischemic lesion, arterial spasm, or occlusion. The average time interval from onset of warning sign to major hemorrhage was 20.7 days: 110.5 days for Group 1, 10.4 days for Group 2, and 21.0 days for Group 3. Therefore, signs in Group 2 suggest the necessity of most urgent medical attention. Results of treatment clearly suggested the group with warning signs fared better than the others. Possible reasons for this are discussed.

AB-1308-73

Factors Disposing to Morbidity in Surgery of Intracranial Aneurysms With Special Regard to Deep Controlled Hypotension—Hugosson R (Department of Neurosurgery, University Hospital, Uppsala, Sweden), Högström S—J Neurosurg 38:561-567 (May) 1973*

In 200 cases of intracranial saccular aneurysm a technique of short-term deep blood pressure reduction, as a rule induced with halothane, was used during the ligation of the aneurysm. The systolic blood pressure was reduced in most cases to about 50 mm Hg. This hypotension gives great advantages in the operative procedure. The vascular tree becomes more mobile, which facilitates the final phase of the dissection. The aneurysmal sac becomes softer, diminishing the risk of rupture when the ligature is being applied, and facilitating control of hemorrhage should it occur. The disadvantage of deep blood pressure reduction is the risk of anoxic damage. The surgical morbidity and mortality were therefore analyzed in detail with respect to the probable cause. In all but one case the symptoms or death could be attributed to one or more other factors (cerebral edema, vascular spasm, surgical trauma, etc.).

AB-1309-73

Cerebral Transit Time of 99m Technetium Sodium Pertechnetate Before and After Cerebral Arteriography—Crandell D, Moinuddin M, Fields M, Friedman B (Section of Nuclear Medicine, University of Tennessee, Memphis, Tennessee 38103), Robertson J—J Neurosurg 38:545-547 (May) 1973*

In a group of 18 patients the cerebral transit time was studied with 99mtechnetium sulfur colloid and 99mtechnetium sodium pertechnetate before and after cerebral arteriography. The results were compared with a similar study in a group of 21 control patients, and no

ABSTRACTS

*Authors' abstract.
statistical difference was noted. Cerebral arteriography, when performed without complications, does not alter the cerebral transit time.

**AB-1310-73**

**Treatment of Multiple Intracranial Arterial Aneurysms**—
Paterson A, Bond MR (Institute of Neurological Sciences, Southern General Hospital, Glasgow, Scotland)—*Lancet* 1:1302-1304 (June 9) 1973*

The most satisfactory method of treatment for multiple intracranial aneurysms after subarachnoid hemorrhage is uncertain. The main choices are total surgical treatment of all aneurysms, partial treatment directed toward the aneurysm responsible for hemorrhage, and bed rest alone. The outcome of these methods has been assessed in a retrospective survey of 162 patients. Despite differences in patients' neurological status after subarachnoid hemorrhage there was no significant difference in the mortality rates associated with the three forms of management. However, surgery within seven days of hemorrhage and attempts to treat all aneurysms at one operation rather than in staged procedures were associated with significantly higher mortality rates than other forms of treatment.

**AB-1311-73**

**Monocular Transient Ischaemic Attacks and the External Carotid Artery**—Lord RSA (Surgical Professorial Unit, St. Vincent's Hospital, Darlinghurst N. S. W. 2010, Australia)—*Med J Aust* 1:742-745 (Apr 14) 1973*

The cases of two patients with transient monocular blindness, even though the ipsilateral internal carotid artery was occluded, are described. In each case retinal perfusion depended upon branches of the external carotid artery, the orifice of which was stenosed. One of the patients suffered transient neurological disturbance in addition to the ocular symptoms. In both cases the symptoms were relieved by external carotid endarterectomy. These patients are examples of the little-recognized phenomenon of ocular and neurological transient ischemic attacks mediated through collateral extracranial pathways. They demonstrate the value of surgical reconstruction of these accessory routes when the internal carotid artery is occluded.

**AB-1312-73**

**Massive Epistaxis From a Ruptured Traumatic Internal Carotid Artery Aneurysm**—Burton R (Cardiothoracic Surgery Registrar, Greenlane Hospital, Auckland 3, New Zealand)—*Med J Aust* 1:692-694 (Apr 7) 1973*

Massive delayed epistaxis after head injury is uncommon. However, when it does occur, the possibility of a ruptured traumatic internal carotid artery aneurysm must be excluded. This is particularly so if the epistaxis is associated with orbital fractures and unilateral blindness or cranial nerve palsies.

*Authors' abstract.

Stroke, Vol. 4, November-December 1973
In complete apallic syndromes with (almost total) loss of the telencephalic gray matter, the supratentorial blood flow and oxygen uptake were found to be only about 20% of the normal. Such cases show no signs of higher functions and they have an isoelectric EEG. Due to the retention of brain stem structures they may, however, show clear-cut signs of arousability with lively brain stem reflexes and primitive motor reactions. In a permanently comatose case—also without higher functions—due to a selective reticular brain stem infarction, but with retained telencephalic morphology on the whole, extremely low values (about 20% of normal) for the supratentorial oxygen uptake and blood flow also were demonstrated. Other states with a severe reduction, but not a complete loss, of higher functions due to posttraumatic stupor and advanced Alzheimer's disease showed higher cerebral blood flow and metabolic values than those related above. Such cases also showed a retention of an often pathological EEG. Two patients with akinetic mutism showed relatively high flow values and by and large a normal relative weight of the cortical gray matter, as well as a normal EEG. Both cases showed slight but definite signs of remaining higher functions. It is concluded that measurements of the supratentorial cerebral oxygen uptake and blood flow may be used to quantitate the functional state of the brain in patients with a loss of, or with a severe reduction of, higher functions (signs of conscious awareness, voluntary motor activity, speech, and memory). It is emphasized that a complete loss of such functions may be caused by a total loss of the cortical gray matter (the complete apallic state), or by a selective lesion of the reticular system of the brain stem.

The purpose of the present study was to investigate the incidence of early recurrent hemorrhage and the survival rate in a series of 34 patients with aneurysmal subarachnoid hemorrhage treated with an antifibrinolytic drug (AMCA) for three weeks. The fibrinolytic activity in blood and CSF from these patients was determined before and at regular intervals during the treatment. The invariably high levels of fibrin degradation products in CSF noted before treatment showed that fibrinolysis was already increased, a finding also suggested by the "fibrin slide technique" for the localization of local fibrinolysis in addition to hypertension. The fact that reblooding occurred after the third week of treatment suggests the necessity of prolonging the prophylactic antifibrinolytic therapy to six weeks with gradual reduction of the dose of AMCA. During such reduction, however, it is imperative to examine the CSF repeatedly to check that complete inhibition of the local fibrinolysis is maintained. Such prophylactic treatment is useful in the management of cases in which operation must be postponed owing to the patient's poor general condition and in cases allocated to conservative treatment.

Changes in cerebral blood flow with increasing intracranial pressure were studied in anesthetized baboons during expansion of a subdural balloon in one of two different sites. With an infratentorial balloon, cerebral blood flow bore no clear relation to intracranial pressure, but was linearly related to cerebral perfusion pressure. Apart from an initial change in some animals, cerebrovascular resistance remained constant with increasing intracranial pressure, and autoregulation appeared to be lost from the outset. With a supratentorial balloon, cerebral blood flow remained constant as intracranial pressure was increased to levels around 60 mm Hg, corresponding to a cerebral perfusion pressure range of approximately 100 to 40 mm Hg. Cerebrovascular resistance fell progressively, and autoregulation appeared to be effective during this phase. At higher intracranial pressure levels (lower cerebral perfusion pressure levels), autoregulation was lost and cerebral blood flow became directly dependent on cerebral perfusion pressure. The importance of the cause of the increase in intracranial pressure on the response of the cerebral circulation and the relevance of these findings to the clinical situation are discussed.

The fibrinolytic activity of human brain was studied with the "fibrin slide technique" for the localization of
tissue plasminogen activators. The material consisted of brains obtained at autopsy of 25 adults without demonstrable intracranial disorders. Measured as the "focal lysis time" the fibrinolytic activity of gray as well as of white matter was found to be low and that of the leptomeninges high. The areas of lysis were situated along small blood vessels scattered over the section. This fibrinolytic activity was found to be localized to the adventitial layer of the vessel. The concentration of plasminogen activators in various parts of the brain was fairly uniform and relatively low. Major cerebral arteries, such as the internal carotid and basilar arteries, showed active centers of lysis in the intimal layer of the vessels. The ependymal cells lining the floor of the fourth ventricle showed very little or no activity. The choroid plexus was rich in plasminogen activators. One might imagine that large amounts of fibrinolytic activators in the leptomeninges may be released into the CSF after vascular damage and/or hemorrhage and thereby interfere with the first stages of vascular repair and premature dissolution of the clot formed after a hemorrhage.

ABSTRACTS

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CSF after vascular damage and/or hemorrhage and
John's General Hospital, St. John's, Newfoundland),

survived and 18 died. One patient had a postoperative
ruptured abdominal aortic aneurysm. Twenty-eight
carotid bruit.

ABSTRACTS

AB-1322-73
Carotid Bruit. Significance in Patients Undergoing an Abdominal Aortic Operation—Teiman RL (435 North Bedford Drive, Beverly Hills, California 90210), Foran RF, Shore EH, Levin PM—Arch Surg 106:803-805 (June) 1973*

Records of 246 patients operated upon for abdominal aortic disease were reviewed. Of 200 patients operated upon electively, findings from auscultation of the neck were recorded in 196. In 40 a carotid bruit was present. Seven of these had a history of cerebral ischemia and in 33 the bruit was asymptomatic. Two patients operated upon electively had postoperative stroke. Neither had a carotid bruit.

Forty-six patients had emergency operation for ruptured abdominal aortic aneurysm. Twenty-eight survived and 18 died. One patient had a postoperative stroke. Presence or absence of a carotid bruit was not recorded.

AB-1323-73
Endarterectomy of the External Carotid Artery. Its Importance in the Surgical Management of Extracranial Cerebrovascular Oclusive Disease—Connelly JE (Department of Surgery, University of California at Irvine, Irvine, California 92664), Steimer EA—Arch Surg 106:799-802 (June) 1973*

Patients with occluded internal carotid arteries are ordinarily not considered to be candidates for carotid reconstructive surgery. This paper, however, demonstrates the rich anatomical collaterals between the external and internal carotid arteries that become more prominent with internal carotid occlusion. Stenosis of the external carotid in accompaniment with internal carotid occlusion thus becomes a significant lesion.

We have operated on 45 such patients in whom the primary therapeutic procedure was endarterectomy of the external carotid. Additional intracerebral blood flow achieved by opening the external carotid in these patients has resulted in significant beneficial clinical effects. A widely patent external carotid can contribute to increased cerebral flow in the presence of various patterns of intracranial and extracranial oclusive disease.

AB-1332-73
Atresia of the Rostral Superior Sagittal Sinus: Substitute Parasagittal Venous Channels—Kaplan HA (Division of Neurosurgery, College of Medicine and Dentistry of New Jersey, Newark, New Jersey 07107), Browder J—J Neurosurg 38:602-607 (May) 1973*

Failure of development of a rostral superior sagittal sinus results in concomitant embryonal establishment of substitute dural and cerebral venous pathways. The longer the segment of atresia of this sinus, the more extensive the compensatory venous channels. These developmental variants assume clinical importance in the interpretation of cerebral angiograms.

AB-1332-73

The response of the brain vessels to i.a. infused epinephrine, norepinephrine and isoprenaline was evaluated. The experiments were performed on isolated canine brains which were perfused from donor dogs. Total venous outflow and perfusion pressure in the circle of Willis were monitored continuously and total cerebral vascular resistance (CVR) was calculated.

The study does not find a correlation between the presence of a carotid bruit and risk of postoperative stroke. We conclude that in patients who need abdominal aortic operation, the finding of an asymptomatic carotid bruit is not an indication for preoperative cerebrovascular arteriography.
Dose response curves were obtained for these three amines, ranging from 0.001 to 10 μg:

1. Both epinephrine and norepinephrine led to an equal dose dependent increase of CVR ranging from +2% to +61%.

2. Isoprenaline showed a dose dependent decrease of CVR ranging from −5% to −51%.

The effects of the amines on CVR are influenced by their effects on extracerebral vessels and by the cerebral autoregulation. After elimination of the calculated autoregulatory influence the true catecholamine effects on CVR are about 50% of the original effects.

A comparison of equimolar doses (1 nmol) of the three amines after infusion of α- and β-blocking agents showed:

1. The effect of epinephrine and norepinephrine on CVR could be reversed by phentolamine. The dilator potency was as follows: isoprenaline:epinephrine:norepinephrine = 1:0.5:0.3.

2. The effect of isoprenaline could be prevented, those of epinephrine were increased by propranolol. The constrictor potency was as follows: epinephrine:norepinephrine:isoprenaline = 1:0.5:0.

These results are discussed in relation to the possible influence of noncerebral tissues including neurocranium and meninges. It is felt that these sources of contamination cannot account for the vasomotor responses and that, consequently, both α- and β-adrenergic activity of the cerebral vessels of the dog has been demonstrated.

**ABSTRACTS**

**Treatment of Cerebral Vasospasm From Subarachnoid Hemorrhage With Isoproterenol and Lidocaine Hydrochloride**—Sundt TM Jr (Department of Neurologic Surgery, Mayo Clinic, Rochester, Minnesota 55901), Onofrio BM, Merideth J—*J Neurosurg 38:557-560 (May) 1973*

Initial experience with intravenously administered isoproterenol and lidocaine hydrochloride in 14 patients with severe spasm from subarachnoid hemorrhage is summarized. All patients were actively deteriorating from progressive spasm without other major complications; 12 of 14 improved, and two died. The method of treatment, results, and rationale for this method of therapy are discussed.

**Cerebral Atherosclerosis in the Dog. II. Cerebral Circulation**—Suzuki M (Department of Pathology, Baylor College of Medicine, Houston, Texas 77025), Fukucachi Y, Shimazu K, Kim HS, Meyer JS—*Arch Path 96:14-17 (July) 1973*

Six dogs, fed an atherogenic diet for 35 months, and six controls were subjected to measurement of carotid arterial blood pressure and hemispheric cerebral blood flow (CBF). The mean values of mean arterial blood pressure (MABP) and CBF showed no significant differences (P > 0.05) between test and control animals. The levels of cerebrovascular resistance (CVR) that were calculated from MABP and CBF on individual animals, however, averaged significantly higher (P < 0.001) in test dogs than in controls. Serum levels of total cholesterol and phospholipids were significantly higher in the test than in the control group. Histological and electron microscopic examination of the cranial arteries of test dogs showed slight to moderate atherosclerosis without luminal occlusion. The results suggest that the increased CVR of test dogs was due to altered vasomotor activity of atherosclerotic cranial arteries.

**The Effect of Angiographic Contrast Media at the Cellular Level in the Brain**—Waldron RJ II (Department of Radiology, Columbia University, College of Physicians and Surgeons, New York, New York 10032), Bridenbaugh R, Purkerson M, Dempsey EW—*Radiology 108:187-189 (July) 1973*

Repeated carotid artery injections of contrast media were performed in cats and cerebral biopsy samples obtained for electron microscopy. Evidence suggests that there are two methods by which the blood-brain barrier may break down with repeated angiography: (a) alteration of the tight junctions between capillary endothelial cells in the brain, allowing passage of matter through these junctions, and (b) transport across the endothelial cells by pinocytosis.

**Carotid-Cavernous Sinus Fistula as a Complication of Carotid Endarterectomy. A Case Report**—Motarjeme A, Keifer JW (Department of Radiology, St. Anne’s Hospital, Chicago, Illinois 60651)—*Radiology 108:83-84 (July) 1973*

A case of carotid-cavernous sinus fistula as a complication of carotid endarterectomy is presented. This complication has been seen in four cases (including the current presentation) since introduction, in 1967, of the use of the Fogarty catheter for extraction of arterial emboli and thrombi. Reevaluation of use of the stit Fogarty catheter for endarterectomy is suggested.

**Techniques for Continuous Measurement of Local Cerebral Blood Flow, P_{a}O_2, P_{a}CO_2 and Blood Pressure in the Non-Anesthetized Animal**—Seylaz J (Laboratoire de Neuro-Physio-Pathologie Humaine, Service de Neurochirurgie, Hôpital Lariboisière, 2, Rue Ambroise-Paré, Paris, France), Aubinene P-F, Correze J-L, Mamo H—*Pflügers Arch 340:175-180, 1973 (Springer-Verlag, publisher)*

Techniques have been developed for the study of cerebral blood flow (CBF) in nonanesthetized, non-curarized animals. Continuous recording of one or several local CBF in subcortical structures can be made, simultaneously with continuous recordings of cerebral temperature, P_{a}H_2O, P_{a}CO_2, arterial pressure and the electrocorticogram. The CBF measurements, obtained...
ABSTRACTS

by a thermal clearance method, are semiquantitative. $P_{aO_2}$ and $P_{aCO_2}$ are measured quantitatively directly in the aorta by mass spectrography. Conventional techniques are used for the arterial pressure and the electrocorticogram recordings. The main advantage of the techniques described is the possibility of undertaking repeated long-duration recordings of the principal cerebrovascular variables on animals not affected by operation stress or by drugs capable of modifying the regulation of CBF.

AB-1331-73

Anti-hypertensive Treatment and the Course of Established Cerebral Vascular Disease—Beavers DG, Fairman MJ, Hamilton M, Harpur JE (Medical Academic Unit, Chelmsford and Essex Hospital, London Road, Chelmsford, Essex)—Lancet 1:1407-1409 (June 23) 1973*

In a group of 162 hypertensive patients who had recovered from a stroke, the recurrence rate of stroke was closely related to the adequacy of control of hypertension. This was in sharp contrast to the frequency of myocardial infarction and angina pectoris, which did not show a similar relationship. The frequency of cardiac failure was significantly higher in patients with poor control of hypertension.

AB-1332-73

A Modified Whole Blood Partial Thromboplastin Test for the Assessment of Heparinisation—Ray PK, Abbott D (Division of Laboratory Haematology and Blood Bank, The New Mount Sinai Hospital, Toronto, Ontario, Canada)—Canad Med Assoc J 108:1505-1508 (June 23) 1973*

Current methods of assessment of heparinization are either inconvenient as bedside procedures or lack correlation with the Lee-White whole blood clotting time over the therapeutic range. A new thromboplastin time (CAT time) has been developed to overcome these disadvantages by offering uniform contact activation. The test makes use of a partial thromboplastin activated in the activation phase of the activated partial thromboplastin time over the therapeutic range. A new thromboplastin test will be helpful in the study of "contact factor" deficiencies.

AB-1333-73

Narrow and Atretic Transverse Dural Sinuses: Clinical Significance—Kaplan HA (Department of Surgery, Division of Neurosurgery, College of Medicine and Dentistry of New Jersey Medical School, Newark, New Jersey), Browder A, Browder J—Ann Otol 82:351-354 (May-June) 1973*

In 422 specimens of cerebral dural sinuses obtained at autopsy, there were 13 with marked narrowing of a segment of one or the other transverse sinuses, and 11 with absence of a part or all of a transverse sinus. In both groups a variety of compensatory venous channels had formed during embryonal development, apparently serving as bypasses for the stenosed or occluded transverse sinus. A knowledge of the anatomical variances at the confluence of sinuses is important to surgeons who manage patients with inflammatory problems implicating a transverse sinus and those performing radical dissection of the neck for cancer.

AB-1334-73

Cerebral Arterial Occlusive Disease With Telangiectasia Associated With Oral Contraceptives—Okawara S-H (Division of Neurosurgery, University of Iowa College of Medicine, Iowa City, Iowa 52242), Calkins RA—Arch Neurol 29:60-62 (July) 1973*

Two cases of cerebral arterial occlusive disease with telangiectasia were described. The patients are white women (ages 39 and 25), who developed symptoms following prolonged use of oral contraceptives. Their courses were slow but progressive. This condition with its characteristic angiographical picture was originally reported in Japan as a variety of cerebral arterial occlusive disease with predilection for young women. Such cases have been reported following nonspecific arteritis, meningitis, radiation therapy, trauma, and in association with neurofibromatosis. A slowly progressive occlusion in the supraclinoid portion of the internal carotid artery of young patients may be the primary lesion. In the two cases described here, prolonged use of oral contraceptives may have been related to the occlusive disease and subsequent telangiectasia.

AB-1335-73

Automatic Respiratory Failure Associated With Infarction of the Medulla. Report of Two Cases With Pathologic Study of One—Devereaux MW, Keane JR (Neurology Service, Los Angeles County-University of Southern California Medical Center, Los Angeles, California 90033), Davis RL—Arch Neurol 29:46-52 (July) 1973*

Two patients had bilateral terminal medullary infarcts with resultant acute failure of automatic respiratory function. Both patients were eventually able to maintain respiration unaided while awake, but remained apneic during sleep. This condition, referred to as Ondine's curse, has been described in association with bilateral high cervical cordotomy, bulbular poliomyelitis, and in single instances of brain stem tumor and infarction. Our cases add further support to the concept of two separate respiratory systems: a voluntary system, with cerebral centers and descending pathways associated with the pyramidal system; and an automatic system, with medullary terminal centers and pathways in the anterolateral portions of the high cervical cord.

AB-1336-73

Extracranial Arterial Reconstruction for Transient Ischaemic Attacks—Lord RSA (Department of Surgery, St. Vincent's Hospital, Sydney, Australia)—Med J Aust 1:781-785 (Apr 21) 1973*

Transient ischemic attacks occur commonly in our community. Untreated they frequently precede a frank stroke or permanent blindness. Extracranial reconstruc-
tion, usually carotid endarterectomy, is an effective form of treatment which can be carried out with low mortality and morbidity.

**AB-1337-73**


In the development of massive brain hemorrhage of hypertension an essential pathogenetic role is assigned to hyalinosis of intracerebral small vessels. As seen in numerous studies, vascular hyalinosis is found almost exclusively in association with long-standing high blood pressure; conversely hyalinosis is by no means always found in hypertension. The mass of statistical data suggests that only long-standing high blood pressure may be relevant to the development of small intracerebral vessel hyalinosis.

**AB-1338-73**

Intracranial Vascular Lesions in Patients With Diabetes Mellitus—Aronson SM (Division of Biological and Medical Sciences, Brown University, Providence, Rhode Island 02912)—J Neuropath Exp Neurol 32:183-196 (Apr) 1973

Of 5,479 consecutive complete autopsies upon patients 25 years of age or older at Kings County Hospital, 677 had some degree of diabetes mellitus. The diabetic group had no substantial increase in either major cerebral artery occlusion or major lethal infarction. The diabetic group had a vastly increased number of small, multiple lacunar lesions, especially in tissues supplied by paramedian perforating arteries, e.g., pontine base, thalamus, and basal ganglia. The average brain weights of diabetics, particularly in the later decades of life, were notably less than the nondiabetics. The crude frequency of cerebral hemorrhage was significantly lower in the diabetic group; also the frequency of arteriolar necrosis was less in severely hypertensive diabetics than in severely hypertensive nondiabetics.

**AB-1339-73**


A 12-year-old girl, who had sudden onset of occipital headache, nausea, and gait disturbance, and died within a few hours, was found to have subarachnoid hemorrhage, especially involving the cerebellum. Of interest was the hypoplasia of the meningo-cerebral vessels and the absence of any aneurysm or cerebellar angioma. The author suggests that this may be a case of nonobstructive Nishimoto-Kudo's disease.

**AB-1340-73**

Behavioral and Neurological Disturbances Associated With Hypoxic Brain Damage—Blagbrough AE, Brierley JB, Nicholson AN (Royal Air Force Institute of Aviation Medicine, Farnborough, Hampshire and Medical Research Council Neuropsychiatry Unit, Medical Research Council Laboratories, Carshalton, Surrey, England)—J Neurol Sci 18:475-488 (Apr) 1973

The effect of hypoxia was studied in 21 Macaca mulatta monkeys. They were trained to perform tests of object alternation, spatial alternation, and visual discrimination, and then were exposed to hypoxic atmospheres (37,500 feet equivalent), retested and later sacrificed. The monkeys' brains were fixed and examined. During the hypoxic exposure four animals died, six others had severe neurological changes and later died, four had neurological deficits but survived, and seven had no signs of behavioral or neurological impairment. Even in the monkeys with transient neurological deficits, neuropathological evidence of brain damage was apparent. Impaired discrimination of visual clues seemed to be related to damage to occipital and temporal cortex. Alternation behavior was disturbed when frontal cortex and its projections to the basal ganglia were damaged. In some of the monkeys a lucid interval after the hypoxia occurred despite eventual neurological deficits and in some cases death.

**AB-1341-73**


A review of 200 patients referred for management of polycythemia vera revealed that 98 patients had vascular complications; 68 had arterial involvement, 39 had cerebrovascular accidents, and 25 had peripheral (limb) arterial involvement. Men and women were about equally represented. If not treated promptly, these patients had increased risk of permanent hemiplegia, monocular blindness, and severe ischemia of the leg.

**AB-1342-73**


A series of 149 carotid operations on 138 patients in whom a diagnosis of carotid elongation and kinking was made was reviewed. Indications for surgery included TIAs, stroke, vertigo, blackouts, progressive mental deterioration, and in one case a pulsatile retropharyngeal mass. In 106 cases the procedure was resection of
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The carotid bifurcation with end-to-end anastomosis of the internal to the common carotid artery. In 102 cases arteriographical study revealed bilateral carotid elongation. Local anesthesia was used in 126 operations (and in almost all cases since 1966). Results were graded as excellent in 28% of the patients, good in 44%, fair in 10% and poor in 18%; the best results seemed to be in the group being treated for TIAs and the worst results in the five patients being treated for progressive mental deterioration. The authors suggest that kinking of the carotid in many cases is a result of the relative elongation of the artery with respect to its adventitia, and also the position of the patient's head (especially during sleep when a vessel may remain in an unfavorable position for extended periods of time).

AB-1343-73

Clinical and autopsy data from 100 patients who died within seven days after a stroke were compared with data from 100 patients who died more than seven days after a stroke. Significant differences in neurological and systemic abnormalities were apparent. In the early-death group, hemorrhagic lesions were more common, whereas in the later-death group infarctions, thrombosis, and severe arteriosclerosis were more frequent. Pulmonary, urologic, and gastrointestinal complications were more common in the later-death group.

AB-1344-73
The Effect of Pyrimidine Compounds on the Potentiation of Adenosine Inhibition of Aggregation, on Adenosine Phosphorylation and Phosphodiesterase Activity of Blood Platelets—Rozenberg MC (Division of Haematology, Prince Henry Hospital, P. O. Box 233, Matraville, N.S.W., 2036, Australia), Walker CM—Brit J Haematol 24:409-418 (Apr) 1973

The effects of the pyrimidine compounds 2,6-bis(diethenalamino)-4,8-dipiperidino-pyrimidine (dipyridamole), 2,6-bis(diethenalamino)14-piperidino-pyrimidine (RA233), and 2-(2 aminoethylamin0)-4-morpholin0/thieno(3,2-d)-pyrimidine-dihydrochloride (VK744) on human platelet aggregation, on (10-14C) adenosine uptake by platelets, and on platelet phosphodiesterase activity were compared. The effect of dipyridamole on adenosine-induced inhibition of platelet aggregation after clearance of adenosine by adenosine deaminase also was studied. All three compounds produced variable degrees of direct inhibition as well as potentiation of adenosine-induced inhibition of ADP-induced aggregation of platelets. As previously demonstrated, RA233 and VK744 were more effective in vitro inhibitors of ADP-induced platelet aggregation than was dipyridamole. No apparent correlation between the direct inhibition and the potentiation of adenosine inhibition of platelet aggregation caused by these three pyrimidines was apparent. Thus, these pyrimidines apparently produced inhibition of platelet aggregation with and without adenosine by different mechanisms. Dipyridamole and RA233 were equally effective in decreasing the rate of phosphorylation of adenosine by platelets, while VK744 had no effect. All three compounds produced some inhibition of phosphodiesterase activity in platelet lysates. This inhibition should prevent the breakdown of cyclic AMP to AMP and thus induce inhibition of platelet aggregation, as has been demonstrated by other investigators.

AB-1345-73
Spinal Reflexes in Cerebral Death—Ivan LP (Department of Neurosurgery, Ottawa General Hospital and Faculty of Medicine, University of Ottawa, Ontario, Canada—Neurology 23:650-652 (June) 1973

All 52 patients diagnosed as having cerebral death in this report had electrocerebral silence for 30 minutes by EEG. However, 75% of these patients retained some form of spinal reflex; superficial reflexes were more frequently present than muscle stretch reflexes. None of the patients had vestibular-ocular responses. The author suggests that the criteria of brain death not include absence of reflexes that are functions of the spinal cord.

AB-1346-73

Three patients (ages 18, 28 and 55) developed the sudden onset of neurological deficits immediately following exercises in which forceful hyperextension of the cervical spine had occurred. One patient was found at craniotomy to have had a cerebellar infarction. The other two had findings consistent with occlusion of the anterior spinal artery. Although all three had not had previous symptoms, one of them was found to have a narrowed foramen magnum and another a narrowed left vertebral artery.

AB-1347-73
Cerebral Aneurysms in Children—Thompson JR, Harwood-Nash DC (Department of Radiology, The Hospital for Sick Children, Toronto, Ontario, Canada). Fitz CR—Amer J Roentgen 118:165-175 (May) 1973

Of the 22 children with cerebral aneurysms in this study, 11 were less than ten years old; 15 had congenital aneurysms, three had traumatic aneurysms, and four had mycotic or "idiopathic" aneurysms. Of the 15 congenital aneurysms, six arose from the carotid bifurcation. The congenital aneurysms were large, ranging from 5 mm to 3.5 cm in diameter, and in only one patient was there an associated extracranial abnormality. The authors suggest that complete selective percutaneous femoral angiography is the best method to diagnose cerebral aneurysms in children.
AB-1348-73
Formation and Size of Platelet Aggregates During Hypovolemic Hypotension in Dog—Lauterjung KL (Lehrstuhl und Abteilung für Experimentelle Chirurgie, 5 Köln 41, Robert-Koch-Strasse 10, Germany), Isselhard W—Angiology 24:107-113 (Feb) 1973

During hypovolemic hypotension, experimentally induced in dogs, platelet aggregation was studied photometrically in arterial and venous blood. Platelet aggregates seemed to originate in venous blood and then be filtered by the dog's lungs. Since platelet changes appeared in arterial blood only after a slight delay. Moreover, the size of the platelet aggregates which could pass the lungs seemed to decrease as the duration of hypotension progressed.

AB-1349-73
Scanning Electron Microscopic Observation of Platelets in Hemostasis—Shimamoto T, Yamazaki H, Shimamoto T (Institute for Cardiovascular Diseases, Tokyo Medical and Dental University, School of Medicine, Yushima, Tokyo, Japan)—Thromb Diath Haemorrh 29:166-182, 1973

Carotid arteries of three rabbits were punctured with a needle and then immediately fixed for examination of their adherent platelets by a scanning electron microscope. The platelets were found to be spheroidal with several pseudopodia. The platelets in the shed blood from the ears of three other rabbits were compared with those of three rabbits which had been heparinized. Immediately after the blood-letting, 84.1% of the heparinized platelets were aggregated as compared to 60.9% of the nonheparinized group; after 60 seconds the ratio was 78.8% to 62.2%, respectively. Initially the heparinized platelets also showed more morphological changes than the nonheparinized platelets, but after 15 to 30 seconds the reverse was observed, i.e., 15 to 60 seconds after the blood-letting, the heparin seemed to inhibit further morphological changes in the platelets in vitro as compared to the control (nonheparinized) blood.

AB-1350-73
Pseudoaneurysms of the Carotid Artery—Blackford JM, McLaughlin JS (Division of Thoracic and Cardiovascular Surgery, University of Maryland School of Medicine, Baltimore, Maryland)—Amer Surg 39:257-260 (May) 1973

Two patients who developed pseudoaneurysms at their arteriotomy sites were discussed and compared with 15 patients previously reported. One of the two patients had developed bacterial colonization of the aneurysmal wall with resultant sepsis, a complication not previously reported. The authors suggest that the diagnosis of pseudoaneurysm be considered in any patient presenting with a painful mass in the neck at any time following carotid artery surgery.

AB-1351-73
The Relationship of Size, Density and Localization of Intracranial Arteriovenous Malformations to the Type of Initial Symptom—Waltimo O (Department of Neurology, University of Helsinki, Helsinki, Finland)—J Neurol Sci 19:13-19 (May) 1973

Of 45 patients with AVMs, 23 presented with seizures, 12 with symptoms of subarachnoid hemorrhage, and ten with intracerebral hemorrhage. Angiography revealed 16 frontal, 14 parietal, seven temporal, four occipital, three posterior fossa, and one central AVMs; 28 were on the left and 17 on the right. The volume of each AVM was approximated by an ellipsoid-volume method. The volumes ranged from <0.1 to 80 cm³. If greater than 7 cm³, an AVM was considered large. Of the 25 patients with "large" AVMs, 72% presented with seizures; whereas of the 20 patients with "small" AVMs (<7 cm³), 75% presented with symptoms of hemorrhage. Location and density of the AVMs were classified by two neuroradiologists not otherwise involved in this study. Compact AVMs had a slight association with seizures, while less dense AVMs more often presented with hemorrhages. All occipital AVMs produced hemorrhages, whereas frontal AVMs had a tendency to produce seizure activity.

AB-1352-73
Microangiography of Human Fetal Spinal Cord—Di Chiro G (Section on Neuroradiology, National Institute of Neurological Diseases and Stroke, National Institutes of Health, Bethesda, Maryland 20014), Harrington T, Fried LC—Amer J Roentgen 118:193-199 (May) 1973

Postmortem microangiography of 69 human fetal spinal cords and 19 cords from infants and children up to six years old revealed that even in a ten-week-old fetus the characteristic "hairpin" arrangement of the thoracic and lumbar radiculomедullary arteries is apparent. In the younger fetuses studied the anterior spinal artery had a straight course as compared to a more tortuous course in some of the older fetuses and in children up to two years of age. In the fetal cords the "watershed" areas of the anterior spinal artery found in adults were not apparent.

AB-1353-73
The Effect of Sodium Dextrothyroxine on Serum Cholesterol and Mortality Rates in Cardiac Patients—Bernstein A (2130 Millburn Avenue, Maplewood, New Jersey 07040), Simon F, Schmitz TH, Warner WL—Angiology 24:205-211 (Apr) 1973

A group of 66 patients with cardiac disease was treated with sodium dextrothyroxine (Choloxin) in individualized doses for periods up to nine years. The serum cholesterol levels decreased from 15% to 20% and were stabilized. Side effects were minimal. The survival rate for the treated patients was compared with previously published studies determined by the life-table method and was found to be comparable to that of diet-treated patients and markedly greater than that of patients not receiving hypcholesterolemic therapy.

AB-1354-73
Carotid Artery Pulse Curve in Occlusive Disease of the Carotid Artery—Uesu CT (Cerebrovascular Section, Veterans Administration Hospital, Long Beach, California 90801)—Angiology 24:147-155 (Mar) 1973

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ABSTRACTS

Carotid pulse curves were compared between 22 patients with occlusive carotid disease documented with four-vessel angio- graphical examinations, 21 patients with nonocclusive arteriosclerotic disease, and 18 control patients. The time interval between the onset of the carotid upstroke curve and the anacrotic shoulder curve was found to be shortened both absolutely and in relation to ejection time in cases of bilateral occlusive carotid artery disease. However, since overlap of the measurements in normal and abnormal arteries was wide, this "percussion wave time" did not seem to the author to be a useful diagnostic criterion for occlusive disease, at least with current methods.

AB-1355-73
Arterial Oxygenation, Findings and Its Significance in Central Nervous System Trauma Patients—Sinha RP, Ducker TB (80 Barre Street, Charleston, South Carolina 29401), Perot PL Jr—JAMA 224:1258-1260 (May 28) 1973

Arterial oxygenation was compared between patients with head and spinal cord injuries and a group of controls. While 97% of the 270 control patients had $P_{A,o_2}$ values greater than 80 mm Hg, half of the trauma group (94 head injuries and 58 spinal cord injuries) had $P_{A,o_2}$ values below 80 mm Hg, with between 10% to 20% of the total number of trauma patients having $P_{A,o_2}$ values less than 60 mm Hg. Since the clinical recognition of hypoxemia is very difficult until a profound fall in $P_{A,o_2}$ occurs, the authors suggest that soon after injury the patient's $P_{A,o_2}$ should be determined in all cases of head and spinal cord trauma so that proper therapy can be instituted.

AB-1356-73
Lactate Acid Efflux from Ischaemic Brain. An Experimental Study—Symon L, Dorsch NWC, Ganz JC (Department of Neurosurgical Studies, Institute of Neurology, Queen Square, London, England)—J Neurol Sci 17:411-418 (Dec) 1972

The lactate acid efflux from ischemic brain tissue was measured in eight baboons, each of which had had one hemisphere made ischemic by the temporary occlusion of a middle cerebral artery. A significant increase in lactate and a fall in pH were detected in blood taken from Labbe's vein draining the ischemic region. Systemic arterial pH, $P_{A,o_2}$, and lactate showed no significant change.

AB-1357-73
Hyperbilirubinaemia in Acute Haemorrhagic Stroke—Herishanu Y, Mazal S, Lavy S (Neurological Unit, Shaare Ze'edek General Hospital and Department of Neurology, Hadassah University Hospital and Hebrew University Medical School, Jerusalem, Israel)—J Neurol Sci 17:369-372 (Dec) 1972

Of 24 patients with acute hemorrhagic stroke diagnosed by clinical examination, lumbar puncture, EEG, and cerebral angiography, 45.8% developed a high total and direct serum bilirubin within five days. The bilirubin level returned to normal limits between the sixth and fifteenth days after the acute stroke. The authors suggest that the parallel rise in direct and total serum bilirubin may be related to changes in hepatic cell polarity caused by the intracranial lesions and increased intracranial pressure.

AB-1358-73
Traumatic Aneurysms of the Intracranial Circulation—Sadar ES, Jane JA, Lewis LW, Adelman LS (Departments of Neurological Surgery and Pathology, University of Virginia School of Medicine, Charlottesville, Virginia)—Surge Gynec Obstet 137:59-67 (July) 1973

Traumatic aneurysms of the circle of Willis and its branches are presented in two patients and compared with 15 similar patients previously reported. These aneurysms produce a higher mortality rate, associated with subarachnoid hemorrhage, when compared with congenital aneurysms. The authors recommend surgical treatment when traumatic aneurysms of this type are diagnosed.

Another three patients with traumatic aneurysms of the intracranial portion of the internal carotid artery are compared with 17 patients from the literature. Since these patients nearly all had significant hemorrhage from this type of aneurysm, the authors recommend ligation of the common carotid artery and clipping of the intracranial carotid when collateral filling is a problem. These procedures seem to have a surprisingly low morbidity in such patients.

AB-1359-73
Electrocardiographic Changes in Cerebral Transient Ischemic Attack—Fujishima M, Tanaka K, Omae T (Second Department of Internal Medicine, The Faculty of Medicine, Kyushu University, Fukuoka City, Japan)—Angiology 24:310-315 (May) 1973

Of 30 patients with a history of transient ischemic attacks, 90% had some type of ECG abnormality during the first 24 hours after hospitalization; 15 had sinus bradycardia, three had supraventricular premature beats, two had atrial fibrillation, one had first-degree A-V block, and 19 had QRS or ST-T wave abnormalities.

AB-1360-73
Immunofluorescent Studies in a Case of Giant-Cell Temporal Arteritis—Sauerbruch T, Stuhlinger B, Kaess H (University Department of Medicine, Heidelberg, Germany)—Germ Med 3:6-8 (Spring) 1973

Immunofluorescent study of a temporal artery from an 83-year-old woman with clinically obvious temporal arteritis revealed part of the complement system ($\beta_1 C / \beta_2 A$), IgG, IgM, and IgA in the vessel wall, but specific immunoglobulins were not otherwise distinguishable. The authors suggest that those deposits were immune complexes; no antigen was identified.

AB-1361-73
Relation of Microcirculatory Thrombosis to Thrombus in the Proximal Coronary Artery: Effect of Aspirin, Dipyridamole and Thrombolysis—Moschos CB, Lahiri K, Lyons

Stroke, Vol. 4, November-December 1973
The distribution of platelets in the microcirculation of the myocardium after experimental platelet thrombosis in a major coronary vessel was studied in mongrel dogs. In the first few hours after the coronary thrombosis microcirculatory platelet thrombosis was consistently observed in the ischemic region. The microcirculatory thrombi were significantly decreased if the animals were pretreated with aspirin or dipyridamole; these drugs did not seem to affect the thrombus in the proximal coronary artery. In other dogs similar beneficial effects resulted when fibrinolysis was infused into the left ventricle one to three hours after the induced coronary thrombosis. The pretreated group had fewer arrhythmias and a decreased mortality rate.

**AB-1362-73**

**Central Neurogenic Control of Cerebral Circulation: Effects of Intravertebral Injection of Pyrithioxin on Cerebral Blood Flow and Metabolism**—Stoica E, Meyer JS, Kawamura Y, Hiromoto H, Hashi K, Aoyagi M, Pascu I (Department of Neurology, Baylor College of Medicine, Baylor-Methodist Center for Cerebrovascular Research, Houston, Texas 77025)—Neurology 23:687-698 (July) 1973

In baboons the injection of pyrithioxin into the vertebral arterial system produced a 44% increase in cerebral blood flow and a 26% increase in cerebral oxygen consumption despite a decrease in blood pressure. Intracarotid injection of this drug increased CBF by only 11%. Inhalation of 5% CO₂ for five minutes, cold applied to the forehead, or atropinization of the brain stem blocked the cerebral vasodilator effect of the drug administered into the vertebral arteries. The vasodilator effect also was blocked if the drug was given immediately after hyperventilation, whereas if given five minutes after hyperventilation an enhanced vasodilator effect of the drug occurred.

**AB-1363-73**

**Cerebral Functional Effects of 2-Deoxy-D-Glucose and 3-O-Methylglucose in Rhesus Monkeys**—Meldrum BS, Horton RW (Medical Research Council Neuropsychiatry Unit, Carshalton, Surrey, Great Britain)—Electroencephalogr Clin Neurophysiol 35:59-66 (July) 1973

The effects of 2-deoxy-D-glucose and 3-O-methylglucose, analogues of glucose that compete with glucose for transport into the brain but are not catabolized for energy production, were studied in 12 adult rhesus monkeys. Intravenous infusion of 2-deoxy-D-glucose produced an apparent reduction of consciousness within one to three minutes with maximal effect in 3 to 15 minutes in the animals; concomitant EEG changes similar to changes during moderate cerebral anoxia also occurred, as did decreases in cerebral arteriovenous differences in oxygen, glucose, and carbon dioxide. The effects of 3-O-methylglucose were similar. Thus cerebral function seems to require a ready supply of glucose, much as it requires its oxygen supply.

**AB-1364-73**

**Transient Cerebral Ischemia: Prevalence and Prognosis in a Biracial Rural Community**—Karp HR, Heyman A (Center for Cerebrovascular Research, Duke University Medical Center, Box 3203, Durham, North Carolina 27710), Heyden S, Bartel AG, Tyroler HA, Hames CG—JAMA 225:125-128 (July 9) 1973

The prevalence of transient cerebral ischemia in a biracial rural community between 1960 and 1969 is reported for 2,455 patients with exclusion of any patient who had a completed stroke or who had died during the survey period. The prevalence of TIAs for white men was 15.9/1,000, for white women 11.5/1,000, for black men 7.9/1,000, and for black women 7.8/1,000. A follow-up period from August, 1969, to May, 1972, showed that about 20% of the patients with TIAs had developed a completed stroke or had died from ischemic heart disease since the time of the survey.

**AB-1365-73**

**Catecholamine Concentrations in CSF and Plasma of Patients With Cerebral Infarction and Hemorrhage**—Meyer JS, Stoica E, Pascu I, Shimazu K, Hartmann A (Department of Neurology, Baylor College of Medicine, Baylor-Methodist Center for Cerebrovascular Research, Houston, Texas)—Brain 96:277-288 (June) 1973

Catecholamines, as determined by a semiautomated trihydroxyindole method, were compared in CSF and venous plasma in five control patients, 23 patients with cerebral or brain stem infarction, and eight hypertensive patients with cerebral hemorrhage. The nonhypertensive patients with cerebral infarction had catecholamine levels similar to the controls. Hypertensive patients who were studied within two weeks of their cerebral infarctions had increased norepinephrine concentrations in their CSF and plasma as compared to the control patients. The patients with the highest catecholamine concentrations in both CSF and plasma were those with hypertensive cerebral hemorrhage. The possible sources and significance of catecholamines in CSF was discussed.

**AB-1366-73**

**Progressive Alternating Hemiplegia in Early Childhood With Basal Arterial Stenosis and Telangiectasia** (Moyamoya Syndrome)—Carlson CB (Division of Pediatric Neurology, University of Washington, Children’s Orthopedic Hospital and Medical Center, Seattle, Washington 98105), Harvey FH, Loop J—Neurology 23:733-744 (July) 1973

A two-year-old boy who had six episodes of alternating hemiplegia died six months after the first episode. Angiography revealed bilateral stenosis of his internal carotid arteries in the supracholinoid regions, diencephalic telangiectasia, and dural anastomoses with the external carotid arteries. At autopsy no significant stenoses or occlusions of the carotid arteries were evident, but microscopic examination revealed focal absence or atrophy of the elastica interna in most arteries of the circle of Willis and its branches. Bilateral
cerebral infarcts of various ages also were found in the distribution of the carotid arteries.

The authors compare this patient to others under six years of age who have been reported as examples of the moyamoya syndrome. In infants a progressive, usually fatal course is apparent. Preschool-age children usually manifest progressive motor and intellectual deficits. The case illustrates that occlusive arterial disease is not necessarily part of the syndrome.

AB-1367-73
Reversal of Cerebral Vasospasm—Peterson EW, Mandy FF, Searle R, LeBlanc R (University of Ottawa Medical School, Ottawa, Ontario, Canada)—Lancet 1:1513 (June 30) 1973

Experimentally induced cerebral vasospasm in a cat and in macaque rhesus monkeys was reversed by topical application of dibutyryl-3', 5'-adenosine monophosphate as compared with application of Ringer's solution.

AB-1368-73

A direct surgical approach with the aid of a microscope is described for six patients who had intracranial artery embolism. In four patients the restoration of circulation was confirmed by angiography; one patient died from cardiac decompensation postoperatively and another from embolic dissemination. Among the four survivors, two retained neurological deficits.

Because of the small size of the obstructed arteries, the authors used an optical magnifying system. They emphasized the value of full operative exposure of the obstructed segment. The extraction of an embolus was facilitated by local use of a fibrinolytic agent or by the careful introduction of a Fogarty catheter into the Sylvian artery. Microsuture techniques with use of clip-grafts were suggested for repair of an inflammatory arterial segment without collaterals.

The authors recommended the direct operative approach of occlusions from emboli only in young patients who are examined early, are conscious, and are free of significant cardiac disease. In other patients extracranial and intracranial arterial shunts were recommended instead.