

**<sup>99m</sup>Tc-DTPA for the Measurement of Glomerular Filtration Rate.** A. F. W. Hilson, R. D. Mistry, and M. N. Maisey. *Br J Radiol* 49: 794-796, 1976.

To investigate the possible use of <sup>99m</sup>Tc-DTPA clearance as an alternative to <sup>51</sup>Cr-EDTA clearance the authors studied glomerular filtration rate (GFR) in 45 consecutive out-patients who were undergoing dynamic renal scintigraphy. In 1 ml of solution 100 μCi of <sup>99m</sup>Tc-DTPA was administered through a catheter in a peripheral vein, followed by 100 μCi of <sup>51</sup>Cr-EDTA in 10 ml of solution and then flushed with 10 ml of normal saline. Equal volumes of the standards and plasma were counted in a dual-channel scintillation counter. There was a good correlation between the estimates of GFR obtained by using the two chelates simultaneously. The single-injection, single-exponential method of GFR estimation was used, which gave a relationship of  $GFR_{Cr} = 2.3 + GFR_{Tc}$  ml/min with a correlation coefficient of 0.99. The authors concluded that <sup>99m</sup>Tc-DTPA is a suitable agent for the estimation of glomerular filtration rate.

**Thallium-201 Chloride Uptake in Tumors, a Possible Complication in Heart Scintigraphy.** P. H. Cox, A. F. Belfer, and W. B. van der Pompe. *Br J Radiol* 49:767-768, 1976.

The authors reported an abnormal concentration of <sup>201</sup>Tl in the left lung, adjacent to the ventricular region of the heart. At autopsy examination a poorly differentiated squamous cell carcinoma of the lung was found that corresponded to the region of <sup>201</sup>Tl activity in the radionuclide study. The tumor infiltrated the myocardium. The possibility that thallos chloride may accumulate in tumors was confirmed in four rats by observing a significant accumulation of <sup>201</sup>Tl activity in rhabdomyosarcoma implants. A more likely explanation of the increased thallium concentration is increased cell membrane permeability of tumor cells to ionic substances. When interpreting thallium scintigrams the authors state it is necessary to be aware of this possibility in patients with tumor localizations in the lung or mediastinum.

**Cerebrospinal Rhinorrhea: Diagnosis and Management.** W. R. Hudson and L. A. Hughes. *South Med J* 68:1520-1523, 1975.

The authors reviewed 108 cases of cerebrospinal rhinorrhea with emphasis on cause, localization, and treatment. By far the most common cause of cerebrospinal rhinorrhea was trauma associated with skull fracture that involved the anterior cranial fossa (78%). Of the traumatic leaks, 18% were delayed in becoming clinically manifest, several for 2 to 3 years. Spontaneous closure occurred in 26% of spontaneous leaks. Cerebrospinal fluid leaks following surgery occurred in 24 patients and intracranial tumor surgery accounted for one-half of these leaks. The cribriform plate was the most common site of both traumatic (21 patients) and nontraumatic (9 patients) spinal fluid leaks. The history of a persistent, clear nasal discharge, usually but not

necessarily unilateral, suggests a leak. The authors found technetium-99m human serum albumin was the most satisfactory intrathecal agent for identifying occult leaks. A most reliable identification of rhinorrhea can be made by collecting a specimen of the fluid and analyzing it for protein, specific gravity, and glucose. Extracranial surgical approaches produced minimal morbidity and should be considered as possible treatment for every patient with cerebrospinal rhinorrhea from tracts in the frontoethmoidal complex, cribriform plate, or sphenoid sinus region.

**Scintigraphy of Sacroiliac Joints in Acute Anterior Uveitis.** A. S. Russell, B. C. Lentle, J. S. Percy, and F. I. Jackson. *Ann Intern Med* 85:606-608, 1976.

In 30 patients with acute anterior nongranulomatous uveitis, bone scans (Tc-99m PP<sub>1</sub>) were reviewed to evaluate associated ankylosing spondylitis. Whole body scintiscans were obtained 3.5 hr after administration of the radiopharmaceutical and data recorded on videotape for purposes of calculating the sacral to sacroiliac concentration of radioactivity. Abnormal bone scans were observed in 19 of the 30 patients studied. These abnormalities were limited to the sacroiliac joints and appeared similar to those seen in overt ankylosing spondylitis. Seven of the 19 patients did not have the transplantation antigen HLA-B27, associated with acute uveitis or ankylosing spondylitis. These findings suggest that acute anterior uveitis may often represent a manifestation of a spondylitic diathesis even in the complete absence of any suggestive symptomatic or radiologic change and, in some cases, with an absent antigenic marker HLA-B27.

**Liver Scanning in Patients with Suspected Metastatic Malignant Disease.** R. F. Uren, R. J. Hutcherson, M. S. Stephen, and J. Wong. *Med J Aust* 2:477-480, 1976.

In 72 patients with suspected malignant disease liver scans were evaluated retrospectively over a 2-year period to determine accuracy of liver scanning for the detection of liver disease including metastases and to evaluate the use of liver scanning to the referring surgeon. Six projections were obtained with a large-field-of-view scintillation camera 20 min after the intravenous injection of 4 mCi of <sup>99m</sup>Tc sulphur colloid. The scans were graded objectively with respect to the uniformity of radionuclide distribution in the liver. For the diagnosis of metastases, the liver scan had an overall accuracy of 83%, compared to 64% for the serum alkaline phosphatase level. Abdominal palpation was unreliable and frequently misleading in the assessment of patients with suspected liver metastases. For screening of patients with suspected metastases, the authors felt that the maximum diagnostic yield from liver scanning could be achieved by a careful classification of abnormalities observed, provided the referring clinicians were aware of the diagnostic implications of each group.

**The Analysis of Radioisotope Brain Scans by Comparison With Normal Patterns of Uptake.** F. Giver, B. F. Perry, and D. Uttley. *Br J Radiol* 49:788-793, 1976.

The authors reported further development of a previously described method for the computer analysis of radioisotope brain scans. The brain scan of a patient was matched with a series of "normal" scans to find the closest fit and the "normal" scan was then subtracted from the patient scan. The results were displayed in terms of the standard deviation from the normal. In a clinical trial the computer analysis was found to be less accurate. This lesser accuracy could be related to the optimization of the photoscan with ( $\text{Na}^{99\text{m}}\text{TcO}_2$ ) where that part of the overall variance arising from counting statistics was reduced, but where that part due to patient-to-patient variation was increased. The authors felt, however, that the "normal" subtraction method could be useful not as a blanket technique for the analysis of all scans, but as a test of a particular photoscan which appeared equivocal to the trained observer.

**Brain Scanning in Patients with Recurrent Breast Cancer.** H. B. Muss, D. R. White, and R. J. Cowan. *Cancer* 38:1574-1576, 1976.

Brain scans were retrospectively reviewed on 116 patients with recurrent breast cancer. Seventy-eight of 79 (98%) asymptomatic patients had normal brain scans. Of the 37 patients with CNS symptoms, 11 (30%) showed radionuclide studies indicative of intracranial disease and consequently received whole-brain irradiation. There was no correlation between the extent or site of extracranial metastatic disease and the occurrence of a positive brain scan. There was a high correlation with the bone scan or skull films when brain scans indicated a peripheral abnormality. The authors concluded that brain scanning seemed unnecessary in the staging of patients with recurrent breast cancer who have no CNS symptoms.

**Computerized Axial Transverse Tomography in Normal Pressure Hydrocephalus.** L. Jacobs and W. Kinkel. *Neurology* 26: 501-507, 1976.

Using CT scan, the authors examined 20 patients with the diagnosis of normal pressure hydrocephalus and compared the results with the pneumoencephalographic as well as radioisotope cisternographic findings and clinical responses to ventricular shunting. The CT scan confirmed the pneumoencephalographic findings of hydrocephalus without cortical atrophy in 13 cases. In the seven remaining patients, the CT scan showed significant cortical atrophy, not shown by the pneumoencephalogram, and it was confirmed by autopsy in one case. There was no relationship between the presence or absence of cortical atrophy and the clinical responses to ventricular shunting. Also there was no correlation between the radioisotopic cisternogram appearance and the presence or absence of cortical atrophy, or the clinical responses to ventricular shunting. Eight patients were found to have greatly enlarged ventricles (25-40% of intracranial volume) up to 4 years after ventricular shunting. There was no relationship between the ventricular size following surgery and the clinical responses. This finding is contrary to the belief that ventricles return to their pre-morbid size following ventricular shunting. The authors felt that current concepts of normal pressure hydrocephalus must be revised in view of these findings.

**A Sensitive Rapid Radioimmunoassay for Angiotensin II.** M. G. Nicholls and E. A. Espiner. *N Z Med J* 83: 399-403, 1976.

This report described a rapid yet sensitive radioimmuno-

assay (RIA) for plasma angiotensin II (A-II). An angiotensin II-bovine albumin conjugate prepared with carbodiimide was injected in rabbits to elicit antibody production ( $^{125}\text{I}$ -angiotensin II was obtained commercially). The hormone was isolated by means of an ethanol extraction of a 0.4-ml aliquot of patient plasma sample followed by evaporation of the ethanol. A mixture of plasma extract, antiserum, and  $^{125}\text{I}$ -angiotensin II was incubated in refrigeration for 24 hr. Dextran-charcoal was employed to separate bound from free hormone; the free hormone was assayed in a well-type gamma detector and standard curves were generated by plotting percent bound hormone versus A-II content. The sensitivity of the assay was reported to be 4 pg A-II. Interassay and intra-assay variability was reflected by coefficients of variation of 7% and 5.3%, respectively. Only slight cross-reactivity with angiotensin I was reported. Mean A-II concentration in 17 adult ambulant normal subjects was 42 pg/ml (range 20-83). In patients with edematous heart failure undergoing vigorous diuresis, A-II fluctuations agreed well with those of plasma renin activity and plasma aldosterone. Very high levels of A-II were seen in patients with Bartter's syndrome. Subjects with primary aldosteronism had low normal A-II levels even while consuming a low sodium diet. In a group of patients with a variety of clinical pathology a significant positive relationship was seen between plasma renin activity and A-II levels.

**DNA-Synthesis of Lymphocytes in Hyperthyroid and Euthyroid Subjects: Effect of  $^{131}\text{I}$  Therapy on Hyperthyroidism.** G. Lundell, J. Wasserman, N. Einhorn, and P. O. Granberg. *Acta Radiologica* 15:33-42, 1976.

DNA synthesis by lymphocytes in euthyroids and in hyperthyroid subjects before and after therapy was investigated. The study groups included: (Group A) 42 hyperthyroid patients (19 with diffuse and 23 with nodular goiters) treated with  $^{131}\text{I}$ ; (Group B) 19 hyperthyroids treated with surgery; (Group C) 18 nontoxic nodular goiter patients treated with surgery; and (Group D) 17 healthy euthyroid controls who had received no treatment. Before and after therapy, blood was drawn from the subjects, and their lymphocytes isolated. The lymphoid cells were incubated for 3 days in a  $\text{CO}_2$ -air mixture. Carbon-14 thymidine was then added and the mixture incubated for a day. The resultant uptake of radiothymidine by cells in vitro (determined by liquid scintillation counting) reflected DNA synthesis. In separate experiments, thyroglobulin as antigen was added to the incubation media to evaluate thymidine uptake.

In Group A, thymidine incorporation decreased after therapy as compared with pretreatment values. Group B subjects, all of whom were euthyroid prior to surgery from antithyroid drugs including thyroxine showed no change in thymidine uptake after surgery. Shortly after surgery the Group C patients evidenced an increased uptake of radiothymidine but did not show increase some time later. Group D controls showed no change in uptake. In the four groups thyroglobulin appeared to have no effect on DNA synthesis. Spontaneous DNA synthesis in untreated hyperthyroid patients was greater than in like patients treated with antithyroid medication, in patients with nontoxic goiter, or in euthyroid controls. The authors believe that the results indicated thyroid hormones affect DNA synthesis directly by stimulating lymphocytes or indirectly by increasing the viability of cells in vitro.