

## ABSTRACTS OF CURRENT LITERATURE

**Cerebral Pathophysiology in Hemorrhagic Shock-Nuclide Scan Data, Fluorescence Microscopy, and Anatomic Correlations.** M. M. Bronshvag; Letterman Army Med. Center, San Francisco, CA. *Stroke* 11: 50-59, 1980

Cerebral damage and death caused by severe blood loss is an important clinical problem, but the cerebral changes occurring during acute and subacute blood loss have not been well defined. The effects of subacute blood loss on cerebral function were studied in 19 healthy female sheep with three additional sheep serving as controls. All 19 experimental animals had bilateral femoral arterial and venous catheters inserted, and four of seven sheep selected for brain scanning had bilateral carotid arterial catheters inserted. All sheep were permitted to recover from the catheter placement for at least 4 days before incremental bleeding. During the bleeding experiment, serial venous blood analyses were performed along with recording of arterial blood pressure, pulse, respiration, and EEG. Evans blue dye, 25 ml of 2.5% solution, was given intravenously to each sheep. Tc-99m albumin complex was injected via carotid arterial catheter in four sheep and intravenously in three sheep. Brain scans before bleeding were normal in all seven sheep. At the point of clinical distress, three sheep had definite diffuse cerebral uptake of radionuclide, and three had equivocal or minimal uptake. Light microscopic examination of cerebral biopsies from these and from the control animals showed no pathologic changes. Fluorescent microscopy showed no leakage of Evans blue dye, and electron microscopy showed no abnormality of the capillary endothelium or of the interendothelial junctions. Evidence of glial end-foot swelling was noted. These findings suggest that the phenomenon of increased cerebral uptake seen in these animals is a response of intact and functioning endothelium to tissue hypoxia or hypovolemia. Enhanced transendothelial transport rather than nonspecific leakage between endothelial cells appears likely to be the mechanism of localization of the radionuclide.

**Positron Imaging of Cerebral Blood Flow During Continuous Inhalation of C<sup>15</sup>O<sub>2</sub>.** R. H. Ackerman, R. Subramanyam, J. A. Correia, N. M. Alpert, J. M. Taveras; Mass. General Hosp. Boston, MA. *Stroke* 11: 45-49, 1980

Testing the hypothesis that the distribution of cerebral oxygen-15 activity during continuous inhalation of C<sup>15</sup>O<sub>2</sub> is related to cerebral blood flow (CBF), five pairs of normocapnic (resting) and hypocapnic studies were performed in four normal male volunteers. Studies during induced hypercapnia were also performed in two of these subjects. Data collection was begun after 7-10 min of continuous inhalation of C<sup>15</sup>O<sub>2</sub> and two-dimensional imaging was performed with the MGH positron camera. In four of the five pairs of studies a mean drop in PaCO<sub>2</sub> of 48 ± 3% resulted in a mean fall in count rate of 24 ± 7%. In two subjects a mean increase of PaCO<sub>2</sub> of 45% resulted in a mean increase in count rate of 8%. Hyperventilation induced a drop in count rate in three of the volunteers. The fourth subject showed a rise in cerebral count rate during hyperventilation on the initial study but showed a drop consistent with that seen in other subjects when restudied with controlled hyperventilation. The count rate response to hypo- and hypercapnia was consistent with that predicted by a mathematical model. The data suggest that this technique provides a measure

of CBF that would be more sensitive to ischemic events than to true hyperemic phenomena.

**Study of Minimal Cardiac Transit Times in Normal Persons during β-Sympathicolysis.** C. Freundlieb, A. Höck, K. Vyska, A. Smolarz, and L. E. Feinendegen; Jülich, Germany. *Nucl Med (Stutt)* 18: 274-277, 1979

The authors examined in a placebo-controlled, double-blind study the influence of propranolol and carazolol [4-(2-hydroxy-3-isopropyl-amino-propoxy)-carbazole] on cardiac minimal transit times (MTT). Thirty normal volunteers, ages 19-58 yr, were studied in three randomly selected groups of ten. Pulse rate and MTT were determined for each person, and then each volunteer received a single equipotent dosage of 40 mg propranolol or 5 mg carazolol or a placebo. Pulse and MTT were redetermined 90 min after medication. With a gamma camera total MTT was determined following i.v. injection of 2 mCi of In-113 DTPA. ECG was used to monitor pulse rate. MTTs were normalized to a pulse of 80 beats per min to eliminate the influence of heart rate and make MTT before and after medication comparable. The authors found MTT values in all groups normal before medication, but after propranolol was given the average MTT increased 25% above normal. Pulse rate slowed from a mean of 84 beats/min before propranolol medication to 60 beats/min 90 min after medication. Slowed heart rate and increased duration of MTT were found to be statistically significant (p < 0.005). MTT and pulse rate were unchanged in volunteers who had received placebos. Carazolol did not influence MTT, but pulse rate slowed from a mean of 80 to 66 beats/min. The authors conclude that MTT determination offers a simple, noninvasive procedure to obtain objective data of the therapeutic effect of β-blocking agents.

**Comparison of Indium-111 Oxinate Labeled Autologous Granulocytes with Indium-111 Oxinate and Indium-111 Chloride as Abscess Scanning Agents. An Experimental Study in an Animal Model.** W. T. Goedemans, M. R. Hardeman, and A. J. Belfer; Amsterdam, The Netherlands. *Eur J Nucl Med* 5: 63-68, 1980

Indium-111 oxine labeled granulocytes were compared with In-111 oxinate and In-111 chloride for scintigraphic abscess localization, tissue distribution studies, and In-111 clearance rate in three goats. Abscess formation followed subcutaneous injection of a phosphate-buffered saline (PBS) suspension of goat droppings and emulsified mineral oil. The granulocyte suspension was made from 20 ml blood using the Ficoll-Isopaque density gradient centrifugation technique. Granulocytes were resuspended in 5 ml PBS containing 0.5% albumin. For the preparation of In-111 oxine labeled granulocytes, the method described by Thakur was used. Granulocytes were tested for chemotactic activity, which showed that viable cells were used. Gamma camera scintigraphy followed injection of In-111 oxinate labeled granulocytes, In-111 oxinate, and In-111 chloride. The camera was equipped with a medium-energy collimator and a minicomputer; the energy window was centered over the 173 keV and 247 keV photopeaks. To image abscesses, counts were collected for 5 min. Tissue distribution was

determined 2 days after isotope administration. One animal received In-111 oxinate labeled autologous granulocytes, one In-111 oxinate, and one In-111 chloride. Radioactivity per gram tissue and clearance of the three radiotracers from blood were determined. Blood samples were subjected to differential centrifugation to determine if radioactivity was localized in plasma, platelets, red cells, or leukocytes. The authors found that the best scintigraphic images were obtained at 24 hr after isotope administration and that abscess visualization was similar with the different substances used. The tissue distribution study demonstrated all tested substances to have a strong uptake in the kidneys. Indium-111-labeled granulocytes and In-111 oxinate had similar uptake patterns in inflamed lymph nodes, lung, spleen and liver, and a clearly different distribution in blood. The clearance indicated a rapid initial clearance of In-111 chloride, which was not bound to cells. Indium-111 oxinate was preferentially bound to red and white cells and cleared gradually from the blood. The radioactivity of In-111 oxinate labeled granulocytes remained bound to the white cell fraction, and the In-111 clearance was gradual. The authors conclude that leukocytes will remain in circulation after In-111 oxine labeling, but that abscess imaging is equally good with In-111 oxinate or with In-111 chloride.

**Radiolodinated Fibrinogen Distribution in Cancer Patients.** D. Casara, G. Cartel, and S. Costa; Padova, Italy. *Eur J Nucl Med* 5: 27-29, 1980

The authors evaluated radiofibrinogen as a radiodiagnostic agent in the detection of malignant disease as well as for scintigraphic tumor detection. Fibrinogen half-life was determined for 80 patients with cancer and ten controls. In 46 of these patients coagulation tests and radiofibrinogen kinetics were also determined. Kinetic studies were done after i.v. injection of 100  $\mu$ Ci of freeze-dried I-125-labeled fibrinogen, in 1 mg iodinated fibrinogen. Ten minutes following injection, blood samples were drawn and then twice daily for 6-7 days. In 30 patients scintigrams were made 6, 24, and 48 hr after i.v. injection of 200-300  $\mu$ Ci of I-131-labeled fibrinogen. A dual, 5-in. rectilinear scanner was used. Platelet count, fibrinogen concentration and fibrinogen degradation products (FDP), antithrombin activity, quick prothrombin time, and PTT were determined. The authors report positive results in radiofibrinogen scintigraphy in 19 of 30 patients (63%). False-negative results were obtained with pelvic and intrathoracic tumors, due to high BG activity. Platelet counts were significantly reduced in patients with lymphoma, Hodgkin's disease, and osteosarcoma. Fibrinogen half-life was significantly reduced in all tumor types, whereas fibrinogen concentration was normal or increased. FDP were increased in patients with lymphomas and ovarian cancer. Heparin therapy increased fibrinogen half-life in seven of ten treated patients from  $44 \pm 10$  hr to  $86 \pm 12$  hr. The authors point out that the alteration in fibrinogen metabolism represents a low-grade consumption since "static coagulation" tests, i.e., fibrinogen concentration, PTT and quick prothrombin time failed to identify the altered fibrinogen catabolism.

**Obstructive Uropathy in Patients with Nonvisualization on Renal Scan.** R. A. Sherman, M. D. Blaufox; Albert Einstein College of Medicine, Bronx, NY. *Nephron* 25: 82-86, 1980

The use of I-131 orthoiodohippurate (Hippuran) has proved effective as a diagnostic renal imaging agent even in advanced azotemia. Prognosis is generally thought to be uniformly poor when nonvisualization occurs. A striking finding, which is the subject of this report, was found in a review of all cases of nonvisualization (at up to 30 min postinjection) seen in the authors' institutions during a 5-yr period. Only those patients without a prior history

of chronic dialysis were included. Of these 28 patients, 21 had chronic renal failure, and five of these had underlying obstructive renal disease of whom four received surgical relief of the obstruction. All four recovered varying degrees of life-sustaining renal function. The remaining 16 patients with chronic renal failure not due to obstruction either died or required chronic dialysis (one was lost to follow-up). An additional seven patients with nonvisualization of kidneys on the orthoiodohippurate scan had acute renal failure and all died. In the evaluation of patients with advanced renal insufficiency and nonvisualization on the hippurate scan, ultrasound examination of the urinary tract should be performed to exclude the possibility of surgically remedial obstruction. It is noted that nonvisualization 1 wk or more after relief of obstruction does not preclude a prolonged period of survival without dialysis.

**Intraoperative Skeletal Scintigraphy for Localization of Osteoid-Osteoma in the Spine—Case Report.** L. A. Rinsky, M. Goris, E. E. Bleck, A. Halpern, and P. Hirshman; Childrens Hospital, Stanford, CA. *J Bone Joint Surg* 62: 143-144, 1980

The authors report a case of the use of intraoperative skeletal scintigraphy as an aid in the localization of osteoid-osteoma at the time of operation. A 12-year-old boy with midthoracic back pain, which was relieved by aspirin, had a Tc-99m bone scan. Focal increased activity was noted on the left side of the 6th thoracic vertebra. Radiographs and myelogram were normal, but tomograms revealed a nidus in the left pedicle of the T6. Because of unchanged patient's symptoms after removal of two-thirds of the pedicle of the T6, the bone scan was repeated 1 mo later and showed the same intense uptake. Because of continuing pain, another operation was performed 3 hr after the injection of 12 mCi of Tc-99m polyphosphate. Using a mobile gamma camera, serial images were made throughout the procedure until the focal increased activity could no longer be seen on the scan. The nidus was never identified grossly, but histological preparations revealed a osteoidosteoma. The patient's back pain disappeared.

**Scintigraphic Skeletal Changes in Non-Dialyzed Patients with Advanced Renal Failure.** K. Olgaard, S. Madsen, J. Heerfordt, M. Hammer, and H. Jensen; University Hospital, Copenhagen, Denmark. *Clin Nephrol* 12: 273-278, 1979

The applicability of Tc-99m polyphosphate (Tc-PP) bone scintigraphy in the diagnosis of renal osteodystrophy was investigated in 51 patients with advanced renal failure who had not been on dialysis treatment. There were 26 females and 25 males with a mean age of 44 yr (range 12-66) and their mean creatinine clearance was 13.2 ml/min (range 2-40). Twenty-seven had chronic interstitial nephropathy, 16 chronic glomerulonephritis, five polycystic kidney disease, two congenital nephropathy, and one nephrosclerosis. In 3 patients with acute oliguric renal failure the influence of the lack of renal function on scintigraphic results was evaluated. Bone scintigrams (12 mCi Tc-PP) were obtained 2 hr after injection, classified as normal, focally abnormal, or showing generalized abnormally increased skeletal uptake of tracer. Those in the latter category were further subdivided into four groups according to the degree of abnormality. Generalized scintigraphic changes were seen in 34 of 51 patients. Creatinine clearance was significantly lower ( $P < 0.005$ ) in those patients with fairly severe scintigraphic abnormalities (Grades 2 and 3) than in those with normal scintigrams. No significant difference was seen due to age, sex, or duration of uremia. Focal scintigraphic changes were present in 11 patients, and 13 patients had halisteresis found on radiographs. All three patients with acute oliguric renal failure had normal scintigrams. The authors conclude that

Tc-PPI bone scintigraphy is a highly sensitive, but nonspecific, method for revealing renal osteodystrophy, even in uremic nondialyzed patients. The scintigraphic abnormalities were not due to the reduced renal excretion of the isotope, but rather to a metabolic bone disorder in uremic patients. The method may be an important supplement in the early detection of renal osteodystrophy and probably in the follow-up during treatment.

**Modulation of Homologous Receptor Concentrations—Sensitive Radioassay for Human Growth Hormone in Acromegalic, Newborn, and Stimulated Plasma.** R. G. Rosenfeld and R. L. Hintz. *J Clin Endocrinol Metab* 50: 62–69, 1980

A receptor modulation assay (RMA) for human growth hormone (hGH) is described in which cells of the IM-9 cell line are pre-incubated with standard or unknown quantities of hGH dissolved in buffer or as serum samples diluted with buffer 1:4 or 1:8, occasionally 1:16 to 1:64. Following pre-incubation the cells are assayed for their ability to bind I-125-labeled hGH. Correction for nonspecific binding was made. Samples for assay were obtained from three patient groups: acromegaly; patients undergoing provocative tests of hGH response; and cord blood from healthy newborns. These and the standards were run in duplicate, and the results compared with those obtained with RIA and RRA. In 10 acromegalic subjects, the mean ratio of RIA to RMA was  $1.00 \pm 0.04$ . A similar correlation was observed in the newborn samples ( $0.89 \pm 0.05$ ) and in the stimulated samples ( $0.98 \pm 0.06$ ). Mean RIA to RRA ratios were 1.42 and 1.80, depending on the antiserum used. This noncompetitive radioassay based on the induction of homologous receptor loss provides a sensitive and specific assay of hGH levels in unextracted plasma and sera. A 50% reduction in I-125 hGH binding was seen after preincubation with 7ng/ml hGH, and the assay was capable of reliably detecting hGH levels of 1.25 ng/ml. Hypopituitary plasma or serum had no demonstrable effect on the modulation of hGH receptor, and no interference was found from a PRL level of 500 ng/ml.

**Radiochromium Distribution in Thyroid and Parathyroid Deficiency.** M. L. Lifschitz, S. Wallach, R. A. Peabody, R. L. Verch, and R. Agrawal; V. A. Hospital, Albany, NY. *Am J Clin Nutrition* 33: 57–62, 1980

This report demonstrates that thyroparathyroid ablation (TPTX) in the rat has a marked effect on Cr-51 distribution, which is reversed by thyroxin ( $T_4$ ) but not by calcitonin (CT) or parathyroid hormone (PTH) replacement. Carrier-free Cr-51 in the trivalent form ( $CrCl_3$ ), 0.5 to 0.7  $\mu Ci$  suspended in 0.1 ml heparinized rat plasma, was administered i.v. to male Sprague-Dawley rats who had undergone prior TPTX. Three days later the total body retention of Cr-51 of the rats was determined. The rats were killed by exsanguination and the Cr-51 content of the serum and various tissues was determined. Serum calcium and  $T_4$  were measured at the onset of each experiment and at death to verify the adequacy of TPTX and the effect of hormonal replacement. TPTX rats retained a significantly greater amount of Cr-51 than the controls ( $46.7\% \pm 1.5$  against  $39.4\% \pm 0.9$ ). Serum retention of Cr-51 in the TPTX state was relatively greater than that of the tissues. With  $T_4$  replacement there was a complete or partial restoration toward normal of the serum and tissue Cr-51 levels in all tissues except bone, which did not decrease, and muscle, which was not affected by TPTX or  $T_4$  replacement. A further augmentation of body Cr-51 retention by PTH and CT was seen in the TPTX rats. Since transferrin levels are increased in hypothyroid rats, it may be that the large increase in serum Cr-51 was in part due to greater binding of Cr-51. The increased uptake of Cr-51 by bone may be a consequence of an increased serum Cr-51 level. The

authors conclude that their data is best explained by theorizing that  $T_4$ , in addition to insulin, promotes cellular transport of Cr, and  $T_4$  deficiency has the opposite effect. The administration of  $T_4$  restored Cr-51 distribution to or toward normal, whereas PTH replacement had no effect.

**Specific Radioimmunoassay of Human Beta-Endorphin in Unextracted Plasma.** E. Wiedemann, T. Saito, J. A. Linfoot, and C. H. Li; University of California, Berkeley, San Francisco, and Davis, CA. *J Clin Endocrinol Metab* 49: 478–480, 1979

This study describes the clinical use of a radioimmunoassay (RIA) for quantitating human beta-endorphin (B-EP), the most potent morphine-like peptide in the brain and pituitary, in diluted raw plasma, or in serum without prior extraction and fractionation. For the RIA, B-EP was labeled with I-125. Human beta-lipoprotein (B-LPH) reacted with the antiserum in this RIA to the extent of only 1.8%, whereas six anterior pituitary hormones and four B-LPH-related peptides failed to react. The RIA had a sensitivity of 2 pg B-EP. From 14 fasting, normal subjects, plasma B-EP ranged from less than five up to 45. Ten replicate measurements on a 250 pg/ml pool yielded an intraassay coefficient of variation (CV) of 8%. Five independent assays on the same pool showed an interassay CV of 10%. In nine patients with untreated Cushing's disease, B-EP was 34–290 pg/ml. After successful alpha-particle irradiation of the pituitary in those patients, B-EP reverted to normal. In six patients with Nelson's syndrome, B-EP ranged from 500–6000 pg/ml. In a patient with bronchogenic carcinoma, B-EP was 360 pg/ml before and was not detectable after tumor resection, suggesting ectopic B-EP production by tumor. In four healthy subjects B-EP was undetectable 8 hr after a single 2-mg oral dose of dexamethasone. In six other subjects with intact hypothalamic-pituitary-adrenal axis, B-EP levels rose after metyrapone administration and after insulin-induced hypoglycemia. The authors hypothesize that the higher baseline B-EP levels in certain normals may have resulted from the subjects being under stress at time of blood sampling.

**Comparison of Imaging Modalities: Clinical Realization and Engineering Potential of Nuclear Imaging.** L. Kaufman and R. S. Hatner; University of California, San Francisco, CA. *SPIE Proceedings* 26: 27–32, 1979

This paper was presented in a session entitled "Comparison of Imaging Modalities" at a Bureau of Radiation Health sponsored symposium on *Recent and Future Developments in Medical Imaging*. The authors review briefly historical developments in nuclear medical imaging, particularly the Anger camera, and comment on the declining popularity of nuclear medical imaging for some types of diagnostic evaluation, especially relative to CT imaging. They argue that a major reason for this decline in popularity is the inferior spatial resolution and poor energy resolution (scatter rejection) of traditional nuclear medical imaging devices. The authors discuss briefly their experience with a high purity germanium (HPGe) camera, which has the ability to provide virtually scatter-free images with 2 mm resolution at several centimeters depth. They suggest that future developments with this imaging device will result in significant improvements in the diagnostic accuracy and appeal of nuclear medicine imaging.

**Precision Computer Display Techniques in Nuclear Medicine.** B. S. Baxter; University of Utah Medical Center, Salt Lake City, UT. *SPIE* 206: 156–160, 1979

Computer-generated nuclear medicine images typically are presented as a matrix of points displayed on a cathode ray tube or

television screen and recorded on polaroid or transparency film. The author identifies three inaccuracies that are commonly present on these images: (a) nonlinear relationship between image brightness and image count density, particularly in light and dark parts of the image, due to nonlinearities in display intensity and/or film response; (b) raster patterns superimposed on the image due to improper interpolation between display points; and (c) artificial density contours or boundaries due to an inadequate number of gray levels in the display. The author has constructed and is testing a precision computer-driven display system that corrects display intensity for display and film nonlinearities, eliminates raster patterns by interpolation between display points using a pyramidal-shaped intensity distribution function, and eliminates and utilizes an essentially continuous gray scale. Representative images of liver phantoms recorded from conventional displays and the precision display are presented.

**Improved Accuracy in the Clinical Diagnosis of Ectopic Pregnancy by the Simultaneous Use of Pelvic Ultrasonography and a Radioreceptor Assay of Human Chorionic Gonadotropin.** M. A. Pelosi, R. J. Damico, P. J. Goldstein, New Jersey Medical School, New Brunswick, NJ. *Surg Gynecol Obst* 149: 539-544, 1979

The authors presented the diagnostic value provided by the simultaneous use of preoperative pelvic ultrasonography and the diagnosis of pregnancy by I-125-labeled human chorionic gonadotropin in three patients with suspected early unruptured extrauterine gestations. In each of these patients ultrasound demonstrated the presence of ectopic pregnancy. Standard pregnancy tests were negative in all, however, the radioreceptor assay of human chorionic gonadotropin was positive in these patients. Unruptured tubal pregnancies were confirmed at surgical exploration. The authors conclude that both tests should be incorporated as standard procedures in the evaluation of patients with suspected extrauterine gestations to reduce the morbidity and mortality associated with this potentially lethal condition.

**Ultrasonic Scanning in Suspected Ectopic Pregnancy.** J. F. Pedersen; University Clinic, Rigshospitalet, Copenhagen, Denmark. *Br J Radiol* 53: 1-4, 1980

The author reviews a consecutive series of 103 ultrasonic examinations performed for suspected ectopic pregnancy. A positive diagnosis of ectopic gestation, made in four cases, was reported only when fetal cardiac activity could be identified outside the uterine cavity. When either a complex mass in the adnexa or some fluid in the cul de sac were present, the diagnosis was that of "possible" ectopic pregnancy. Since an echo-free area is frequently seen in the uterine cavity accompanying an ectopic gestation, demonstration of a fetus within the gestational sac is mandatory for confirmation of an intrauterine pregnancy. An empty uterus without an adnexal mass or with a simple, ovarian cyst essentially excludes ectopic gestation. In the current series, the true-positive rate was 100%. Ectopic gestations were seen in five of 24 cases labeled "possible," and the true-negative rate was 99%.

**Ultrasound Diagnosis of Interstitial Pregnancy: Findings and Pitfalls.** Mary Graham and Peter L. Cooperberg; University of British Columbia, Vancouver, British Columbia, Canada. *J Clin Ultrasound* 7: 433-437, 1979

Albeit a rare entity, representing only 2.5% of tubal gestations, interstitial pregnancy represents both a more difficult diagnostic

problem and a more serious threat to maternal health than the much more common ampullary ectopic pregnancy. The authors describe four cases of interstitial pregnancy noting that the two most helpful diagnostic findings are the lack of a complete myometrial mantle around the gestational sac and the eccentric location of the sac in relation to the remainder of the uterus. These two characteristics of the interstitial pregnancy served to distinguish this entity from other pathologic conditions, as a pregnancy in one horn of a bicornuate uterus or pregnancy in a myomatous uterus. Examples of both interstitial pregnancies and the differential diagnostic possibilities are provided.

**The Accuracy of Ultrasound in the Detection of Cirrhosis of the Liver.** K. C. Dewbury and B. Clark; Southampton General Hospital, England. *Br J Radiol* 52: 945-948, 1979

In a study of 67 patients with biopsy proven cirrhosis the authors found an echo pattern suggestive of this abnormality in 43 or 65%. A bright echo pattern, either fine or coarse, frequently accompanied by distal attenuation of the beam was suggestive of the diagnosis. If the histology is further subdivided, it is seen that micronodular cirrhosis with or without fatty infiltration produced positive ultrasound scans in over 80% of cases, whereas macronodular cirrhosis produced abnormal scans in only 20% of patients. Since 35% of patients in the total series were seen to have a normal echo pattern with histologically proven cirrhosis, the authors question the validity of this method as a screening device in the cases of suspected cirrhosis. Representative scans are provided.

**Real-Time Ultrasound Examination in the Diagnosis of Gastrointestinal Tumors.** W. Schwerk, B. Braun, and H. Dombrowski; University of Marburg, West Germany. *J Clin Ultrasound* 7: 425-431, 1979

The authors report their experience with 73 gastrointestinal tumors visualized by means of ultrasound. The most common pattern encountered is that of the "intestinal cockade," involving a sonolucent, ovoid mass-effect with dense, central echoes, the latter representing the gas-containing lumen. Tumors of both stomach and large intestine were identified as well as inflammatory thickenings of the small bowel. The "intestinal cockade" sign is not felt to be specific for neoplasm and can be closely simulated by inflammatory processes. Although ultrasonography is not considered suitable for the diagnosis of early stages of gastrointestinal neoplasms, knowledge of the sonographic appearance of such entities is valuable since ultrasound is frequently used as the first diagnostic measure in cases of palpable abdominal masses. In addition, mesenteric metastases can be identified by this method. Sonograms and their correlating radiographs are provided.

JOHN J. COUPAL  
PEGGY DOMSTAD  
ANDREW FRIED  
EUI SHIN KIM  
University of Kentucky  
Medical Center and  
VA Hospital  
Lexington, Kentucky

JOHN H. CLORIUS  
Deutsches Krebsfor-  
schungszentrum  
Heidelberg, Germany

JAMES A. SORENSON  
University of Utah  
Medical Center  
Salt Lake City, Utah