highest uptake was observed by the capsule. So the positive scan of subdural hematoma shows three layers characteristically; they are the semilunar “cold area” which corresponds to the hematoma itself, the linear highly positive layer to the capsule and diffusely positive layer to the edematous brain tissue due to compression by the hematoma.

Group 3, Head Injury: Ten cases of head injury were considered to have had cerebral edema and had recovered in two weeks or more without remaining any neurological deficit. Seven out of 10 cases were positive on initial brain scan (70.0%). Selecting the cases of which the time interval from injury to scan are within two weeks, 7 out of 8 cases become positive (87.5%). This time interval would be the most important factor in scanning of these cases. We also demonstrated the fact that the initial positive scan disappeared on the rescan after two weeks or more with complete recovery of the neurological signs in 3 cases.

Group 4, Cerebrovascular Disease: This group consists of 5 cases with cerebral softening and one with Wallenberg’s Syndrom, of which 3 cases were positive. One case with cerebral softening demonstrated clear localization on the scan in accordance with the lesion found at autopsy. It was suggested that on scanning the cases with cerebrovascular disease the most important factor would also be the time interval from the onset of symptoms to scan.

On the basis of these clinical observations, we have made some experimental studies on the uptake of Neohydrin by the edematous brain tissue. Here we found the fact that Neohydrin injected intravenously was accumulated about 5 times highly in the edematous hemisphere of rats brain than the other side on which cold induced edema had been made.

We also studied on the degree and extent of cold induced edema of brain by autoradiographic techniques using $^{203}$Hg labeled Neohydrin which hasn’t yet been reported. The macroautoradiogram of dogs brain demonstrated the highly accumulation of Neohydrin in the edematous brain tissue and the microautoradiogram of the edematous brain tissue of rats showed that the silver grains due to $^{203}$Hg were heavily located along the capillary wall where we supposed to be extracellular space of brain.

$^{99m}$Tc Pertechnetate for Brain Scanning

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Fifty-six brain scans with $^{99m}$Tc were performed in 52 cases suspected of harboring brain tumors, intracranial hematomas and other space-occupying intracranial lesions in the past six months.

Prior to intravenous administration of 10 mCi of $^{99m}$TcO$_4^-$, 200 mg of potassium perchlorate was given orally in every patient. Scans were performed 1-2 hours after intravenous injection of $^{99m}$TcO$_4^-$. Results were summarized in the table. Of 35 cases in which the circumscribed mass lesions were proved later either by neurological examination, at operation or necropsy, the scans were positive and localized the lesions correctly in 28 cases (80%). Seven false negative scans were obtained, including one each of ependymoblastoma in the 4th ventricle, small hemangioma in the lateral ventricle (1 x 1 cm in diameter), acoustic neurinoma, pituitary adenoma, metastatic cancer, and two cases of infiltrative glioma in the third ventricle region.

Although the diagnostic rates do not exceed those of arteriography and/or air studies, we found brain scans with $^{99m}$Tc useful particularly in the masses in the parieto-occipital or parasagittal region, and as a screening procedure for chronic subdural hematomas following head injury.
Studies on the Regional Pulmonary Blood Flow by $^{131}I$-MAA Lung Profile Scanning (Gravitational changes in the distribution of pulmonary blood flow)

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Recently it has been reported by many investigators that the normal distribution of pulmonary blood flow is affected by the hydrostatic pressure. In upright lung the blood flow decreases fairly steadily from the base to the apex there being virtually no flow at the apex. Today normal distribution of pulmonary blood flow has been well established, impaired distribution of pulmonary blood flow, however, has been poorly reported, although there is only striking exception. The patient with severe mitral stenosis or acute left ventricular failure has been found that the blood flow to the upper zone exceeds that to the lower zone in upright lung. We also previously studied the regional pulmonary blood flow of upright lung using $^{131}I$-MAA profile scanning techniques in various cardiac disorders and noticed marked reduction of blood flow in the lower zones followed by marked increase in the upper zones in some cardiac diseases as severe mitral stenosis. At the same time hemodynamic studies were consecutively performed using the techniques of the right heart catheterization and the transseptal left heart catheterization. We have seen that upper to lower ratio of pulmonary blood flow of upright lung shows better correlation to the left atrial pressure than to the pulmonary arterial pressure.

Our present work is to study the distribution difference of pulmonary blood flow between the supine lung and the upright lung in various cardiopulmonary disorders.

Materials & Methods:
8 healthy volunteers and 41 patients with cardiopulmonary disorders were investigated.

The technique to be used is schematically shown in Fig. 1. The subject lies supine and about 50 μCi of $^{131}I$-MAA ($^{131}I$-labeled...