RADIOISOTOPIC STUDIES OF THE EFFECTS OF CIGARETTE SMOKING UPON DISTRIBUTION OF PULMONARY VENTILATION AND BLOOD FLOW

Kenneth M. Moser (grantee) and August Miale, Jr.
Department of Medicine
Georgetown University Hospital
Washington, D. C.

This project will combine radioisotopic and pulmonary functional technics to determine: (a) the effects of acute and chronic cigarette smoking upon ventilation and blood flow in the lung; (b) the correlation between such effects and alterations in spirometric performance and arterial blood gas values; (c) pharmacologic and other methods which may prevent or reverse the effects observed.

Initial studies will involve perfusion and inhalation radioscans, utilizing the scintillation camera (SC), in normal subjects and patients with chronic obstructive pulmonary disease. Such subjects also will be studied by standard spirometric technics and (resting) values for arterial Po_2, Pco_2 and pH. During this control phase, developmental efforts will include: preparation of Tc^{99m} albumin macroaggregates; study of the influence of various technical factors on inhalation scans; evaluation of special methods for improvement in the quality of data provided by both perfusion and inhalation scans.

Further phases of the investigation will be concerned with sequential studies (spirometric, blood gas, inhalation and perfusion scans) in subjects with and without pulmonary disease before, during and after cigarette smoking.