# Studies on Comparison Between Graphycal Analysis and Analysis by Using Simulation Model of the Washout Curve of Xenon-133

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It was attempted to compare values of ventilation function obtained from the simulation model with that obtained from the graphical backward projection technique.

The subjects were administered i.v. 5 m Ci of xenon and rebreathed xenon into closed circuit until xenon was uniformly distributed in the lungs. When equilibrium was achieved, the system was then closed off and the subjects breathed the room air while data are recorded on magnetic tape. The washout curves were corrected for the influence of xenon uptaken by the chest wall.

In order to analyze the curves by the simulation model, it was assumed that the lungs consisted of a common dead space and 6 regions which contained fast and slow compartments. Substituting the experimental data for FRC, dead space, tidal volume, and intial counts in the model, the washout curve of the model lungs could be computed and fitted to the experimental washout curve adjusting regional tidal volumes.

Furthermore regional ventilation is calculated from the same washout curves by the backward projection technique.

The values of ventilation obtained from the backward projection technique are equal to the values from the model assuming that the volume of dead space is equal to 0. However, under a physiological condition, a common dead apsce is being, and the turn over rate of $^{133}$Xe is apt to decrease with time in the fast compartment and increase in slow compartment. Therefore ventilation cannot be exactly obtained from backward projection techinique.

# Studies on Regional Pulmonary Function by Using Xe-133 and Computer-processed Scintigraphy

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Regional pulmonary functional studies used a large-view scintillation camera coupled with a 42000-parallel-hole-collimator and a computer with 16-K memories. Scintigraphic informations were