169 DETERMINING OF CARDIAC OUTPUT BY RADIO-
NUCLEIDE ANGIOCARDIOGRAPHY WITH COMPUTER
PROCESSING. H. Hara, C. Yamanaka, S. Nara, H. Maki,
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Because conventional method of determining
cardiac output with radionuclide tracer is time consuming, we made use of computer
processing of radionuclide image in 56 pa-
tients and compared with the thermodilution
method. With the scintillation camera angu-led 30° to 60° to the left, a bolus of 15 to
20 mC Tc-99m HSA was injected. Image was
obtained 2 frame per second for a minute
followed by 1/60 frame per second for 9 min-
utes. The data were processed by the com-
puter. The region of interest was set up
manually over RV and LV. Cardiac output was
calculated from activity of each ROI. Car-
diac output of RV and LV correlated each
other well (r=0.83). Cardiac output of RV
correlated well with that from thermodilu-
mation method in most patients (r=0.43).
Dis-
crepancy in a small number of patients could
be explained by poor positioning of the de-
tector. We have proved with the artificial
heart that if the components upon ROI causes elevation of the satu-
ration level resulting in apparent increase
in cardiac output. Radionuclide angiocardi-
ography with computer processing was proved
to be a simple and reliable method of meas-
uring cardiac output with the detector prop-
erly positioned.

170 L-R SHUNT RATE EVALUATION METHOD WITH COM-
PARTMENT MODEL AND MULTI ROI. K. Nishimura, T.
Miyamae and Y. Dohi. Saitama Medical School
Saitama.

There are many methods to determine quan-
titatively the L-R shunt caused by VSD, ASD
or PDA. So far the gamma variate and the
exponential function fitting methods were
reported for the evaluation of the shunt rate. The use of these function fitting
methods are limited to the cases of good
bolus, no dilatation of right heart and no
pulmonary hypertension. To improve these
disadvantages we applied the 4-compartment model (corresponding to right heart, lung,
left heart and surrounding organs) and tried
to widen the applicable range. The method
takes into account the information of the
input bolus curve, so that a bad shaped
bolus does not affect so much the applica-
bility. Because the method uses the para-
meters such as staying times of radionuclide
in the organs or delayed times between the
organs, varieties of organ sizes and blood
flows do not lead to errors. We tried to
lessen the arbitrariness of the values of the parameters by setting ROI's on right
heart as well as lung and innominate vein
and by elaborating the time regions in which
the values of the parameters are determined.
As this procedure makes manual operations of
computer complicated, we developed the
program which finds out automatically the
optimal parameters including the shunt rate.
The good correlation with the oximetry
method (r=0.88) is obtained.

171 EVALUATION FOR ACCURACY OF Qp/Qs RATIOS
DETERMINED BY RADIONUCLIDE METHOD USING
SIMULATED PULMONARY TIME-ACTIVITY CURVES
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Taguchi. Department of Radiology, Mie University
School of Medicine, Tsu.

This study was aimed to evaluate the accuracy of pulmonary-to-systemic flow
ratios (Qp/Qs) in patients with left-to-
right (L-to-R) shunt determined by radio-
uclide(RN) method using simulated pulmo-

nary time-activity curve (simulated PTAC).
It was assumed that each component due to
initial passage, shunt flow and recircu-
lation in a PTAC could be expressed as
gamma functions respectively. Simulation
was performed as follows; 1) separation of
an original PTAC with L-to-R shunt into
three components using a gamma function, 2)
Variation of the Qp/Qs, appearance time of
shunt flow and recirculation, 3) Summation of
three components, 4) generation of noise
for the summed curve.

Thus obtained various simulated PTACs were
analyzed using the gamma function method
(GFM) and the deconvolution analysis (DA).
Linear regression analysis of the Qp/Qs
determined by GFM with those given in 24
simulated PTACs was r=0.89 (Y=0.84x+0.28)
and DA showed higher correlation more than
GFM (r=0.97, Y=0.96x+0.03).

It is considered that the evaluation for the
analytical accuracy which various RN
methods have for detection of the Qp/Qs is
possible without comparison with the Qp/Qs
by other methods with errors of measurement.

174 DETECTION OF TRANSIENT ISCHEMIC ATTACK OF
VARIANT ANGINA USING TI-201 MYOCARDIAL PER-
FUSION IMAGING. K. Fujita, K. Abo, N. Horayama,
T. Konishi, N. Hamada, T. Nakano, H. Takezawa, H.
Maeda, T. Nakagawa and N. Yamaguchi. 1st
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Fifteen patients with variant angina
undergoing coronary arteriography performed
TI-201 myocardial perfusion imaging (MPI).
In 11 out of 15 patients, MPI showed perfu-
sion defect transiently during attacks pro-
voked by methacholine (6/8), ergonovine
maleate (1/1) and treadmill or Master's two
step exercise (4/6). In a 28 y/o case with
old myocardial infarction, methacholine-
induced defect of TI-201 uptake suggested
transient coronary arterial spasm as a
cause of preceding myocardial infarction.
The site of perfusion defect induced by pro-
vocative methods was fairly concordant with
that of ST-segment elevation and coronary
arterial spasm. Therefore, MPI had a clini-
cal usefulness in detection of abnormal per-
fusion on attacks of variant angina.