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TIME HISTOGRAM OF EJECTION FRACTION DURING EXERCISE AND RECOVERY PERIOD STUDIED BY NUCLEAR STETHOSCOPE. S. Kinoshita, M. Ide, T. Ra, Y. Morimoto and Y. Dohi Department of Internal Medicine, M. Mashimo, K. Nishimura and Y. Miyamae Department of Radiology, Saitama Medical School, Saitama

The nuclear stethoscope (NS) allows to know the beat-to-beat left ventricular ejection fraction (EF). Utilizing this function of NS, authors estimated EF, as well as the heart rate and the blood pressure every one minute during and after the supine ergometer exercise. Subjects in this study were ten healthy males and seven patients with ischemic heart disease. The results were as follows: 1. Whereas the heart rate and the blood pressure decreased in early phase of recovery time after exercise, EF exhibited abrupt increase in this phase in all subjects except one who had severe SOB during exercise. 2. The "a" value of the regression line ( $y=ax+b$ ) in the sequential estimation of EF revealed that this value was positive in healthy men and was negative in IHD with one exception.

In conclusion, estimation of EF every one minute during and after exercise by using NS is useful to evaluate the left ventricular function in patients with IHD.

## 1131

ACCURACY, REPRODUCIBILITY AND CLINICAL APPLICATION OF THE NUCLEAR STETHOSCOPE. H. Tomiya, Y. Furukawa, T. Ishide, M. Shimizu, C. Sato, K. Yamada, F. Deguchi, M. Katagiri, M. Tonooka, Y. Hino, Y. Sugiyama, H. Murayama, T. Saito, N. Arimizu and Y. Inagaki The Third Dept. of Internal Medicine and Dept. of Radiology, Chiba Univ. School of Medicine, Chiba.

The nuclear stethoscope (N.S.) is an apparatus provided as a safe, noninvasive, repeatable method for determining left ventricular ejection fraction (E.F.).

We assessed the accuracy and reproducibility of E.F. by the N.S., and applied it to stress testings in essential hypertension.

In 36 patients, E.F. by the N.S. was well correlated with camera-computed E.F. ( $r = 0.905$ ), and even in 10 patients with cardiac catheterization, E.F. by the N.S. was well correlated with E.F. by left ventriculogram ( $r = 0.84$ ). In 101 patients, the E.F. by N.S. had excellent reproducibility ( $r = 0.97$ ). Therefore the N.S. is useful for measurement of E.F. Next in 8 normals, 7 juvenile essential hypertension and 10 middle-aged essential hypertension, E.F. by N.S. was measured during stress testings and infusion testing of isoproterenol. Increase in the E.F. by N.S. was greater in juvenile essential than in middle-aged essential hypertension. Thereafter acceleration of  $\beta$ -adrenergic mechanism in juvenile essential hypertension was suggested.

In conclusion, it was showed that the nuclear stethoscope was useful in assessment of left ventricular function.

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CLINICAL APPLICATION OF NUCLEAR STETHOSCOPE (BIOS). — EVALUATION OF LEFT VENTRICULAR EJECTION FRACTION DURING EXERCISE IN I.H.D. PATIENTS. — M. Shimizu, Y. Furukawa, J. Iwata, Y. Ueda, K. Makita, H. Tomiya, Y. Yumura, F. Hatogai, T. Mizuno, A. Nakayama, T. Saito, Y. Inagaki, and N. Arimizu The Third Dept. of Internal Medicine and Dept. of Radiology, Chiba Univ. School of Medicine, Chiba.

Nuclear Stethoscope (N.S.) is a simple cardiac scintillation probe with micro-computer, which provides real time left ventricular ejection fraction (E.F.) well correlating with multigate camera-computer E.F. ( $r=0.91$ ). 13 I.H.D. patients and 12 normal healthy subjects were studied during the multistage stress test by bicycle ergometer in supine position.

I.H.D. patients were defined electrocardiographically with criterion of ischemic ST segment depression more than 0.1mV during exercise.

E.F. was measured every 4 minutes during exercise and it increased in normal subject with stress. While, in contrast, E.F. decreased with stress in I.H.D. subjects.

Although, there were some problem with N.S. in detecting left ventricle and proper background during exercise, the usefulness of N.S. was suggested in evaluating left ventricular reserve in stress testing.

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EVALUATION OF SCINTIGRAM IN EMERGENCY THERAPY. Y. Kawamura, I. Okuzumi, M. Fukumoto, H. Oosawa, J. Yamazaki, S. Suzuki, S. Hasegawa, S. Iida, T. Morishita 1st Internal Medicine of Toho University, Tokyo. G. Kamishima, H. Baba Emergency Center of Toho University, Tokyo.

Recently, early diagnosis and therapy has been required according to development of ICU and CCU. We had a chance of emergency radioisotope examination using low energy mobile scintillation camera (LEM). This camera was light, small, and easily movable, moreover, included in multimode image for dynamic examination. We studied 55 patients, who were needed for emergency examination, acute myocardial infarction, pulmonary infarction, aortic aneurysm etc. The examination by this camera was extremely useful for diagnosis, severity, and prognosis, and was thought that necessity increased in ICU and CCU treated high risk patients, on and on.