

Cyclotron for Nuclear Medicine

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Today, there are about one hundred cyclotrons over the world and one fourth of them are used in medical application. These cyclotrons can be classified into four types; ordinary (classical), synchrocyclotron (frequency modulated), AVF (sector focussing) and ring (separated sector) cyclotron. Features of these types will be presented in view for radioisotope production for nuclear medicine.

Radioisotopes of C, N and O are very short lived. Then, these isotopes can not be transported and must be made by the cyclotron housed within a hospital. Now, this type of cyclotron is manufactured by four companies, and performances of these commercial cyclotrons are listed in the table. Present status of cyclotron engineering will be discussed together with its medical use.

The prototype Baby Cyclotron has been working in the National Nakano Chest Hospital, Tokyo, since May, 1979. Experiences of its operation and utilization will be reported.

Table 1 Commercial "in-house" Cyclotron

		E_p	E_a	Weight
The Cyclotron Co.	CP-16	16 MeV	8 MeV	17 ton
Japan Steel Works Ltd.	BC-105	10 MeV	5 MeV	8 ton
	BC-108	10 MeV	8 MeV	13 ton
Sanditronix Ink.	RNP-16	16 MeV	8 MeV	18 ton
Sumitomo-CGR-MeV	CYPRIS	13.6 MeV	8 MeV	14 ton