A SURVEY OF PACEMAKER IMPLANTATION IN JAPAN – 1985:

Report from the Pacemaker Committee of the Japanese Circulation Society with the Japan Society of Medical Electronics and Biological Engineering, and the Japanese Cardiac Pacing Society

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The annual survey of pacemaker implantations in Japan is conducted under the auspices of the Pacemaker Committee of the Japanese Circulation Society with the Japan Society of Medical Electronics and Biological Engineering, and the Japanese Cardiac Pacing Society. This report will deal with results of the 1985 survey and compare them with the previous data.^{1,2}

I. Survey

Questionnaires were sent to 948 institutions where pacemaker implantation activity was supposed. Data were gathered on total number of implants, number of initial implants and replacements, and number of DDD implants.

DDD was defined as any dual chamber unit, including VDD. Data was analyzed by ten geographic regions (Hokkaido, Tohoku, Kanto, Tokai, Koshinetsu, Hokuriku, Kinki, Chugoku, Shikoku, and Kyushu). Implant to population ratios were calculated from population figures published by the Ministry of Home Affairs.

II. Results

1. Response to Survey (Table I)

Responses were received from 592 of the 948 institutions (62.5%) to which questionnaires were sent.

2. Number of implanting Institutions (Table II)

Of the 592 institutions that responded, 497

Table I Background Statistics

	Survey Number	Replies Received	Response Rate (%)
Hokkaido	83	51	61.5
Tohoku	105	64	61.0
Kanto	329	173	52.6
Tokai	81	56	69.2
Koshinetsu	60	41	68.4
Hokuriku	19	13	68.5
Kinki	103	75	72.9
Chugoku	45	38	84.5
Shikoku	49	30	61.3
Kyushu	74	51	69.0
Total	948	592	62.5

Table II Implanting Institutions

	1985	1984	Difference
Hokkaido	38	46	-8
Tohoku	48	52	-4
Kanto	130	138	-8
Tokai	51	56	-5
Koshinetsu	36	33	3
Hokuriku	12	10	2
Kinki	74	70	4
Chugoku	35	33	2
Shikoku	24	29	-5
Kyushu	49	51	-2
Total	497	518	-21

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Table III Annual Implant Number

	1985	1984	Difference
Hokkaido	506	617	-111
Tohoku	743	631	112
Kanto	2023	1876	147
Tokai	549	528	21
Koshinetsu	389	358	31
Hokuriku	259	219	40
Kinki	1291	1099	192
Chugoku	591	588	3
Shikoku	275	258	17
Kyushu	815	825	-10
Total	7441	6999	442

Table IV Implants per Institution

	1985	1984	Difference
Hokkaido	13.4%	13.4%	0%
Tohoku	15.5	12.1	3.4
Kanto	15.6	13.6	2.0
Tokai	10.8	9.4	1.4
Koshinetsu	10.8	10.8	0
Hokuriku	21.6	21.9	-0.3
Kinki	17.5	15.7	1.8
Chugoku	16.9	17.8	-0.9
Shikoku	11.5	8.9	2.6
Kyushu	16.7	16.2	0.5
Average	15.0	13.5	1.5

implanted pacemakers. This absolute figure represents a 6% decrease over 1984 (518 institutions), but is thought to be due to a lower response rate.

3. Annual Implant Number (Table III)

7,441 pacemakers were implanted in 1985. This represents a 5.5% increase over the 6,999 total of 1984.

4. Implants per Institution (Table IV)

The average number of implants was 15.0 per institution. This represents a 1.5% increase over the 13.5 average of 1984.

5. Initial Implants (Table V)

Initial implants comprised 76.6% of the total,

Table V Initial Implants

	1985	1984	Difference
Hokkaido	75.7%	71.2%	4.5%
Tohoku	82.9	80.2	2.7
Kanto	76.4	74.0	2.4
Tokai	70.0	72.7	-2.7
Koshinetsu	82.0	77.7	4.3
Hokuriku	79.2	77.6	1.6
Kinki	73.2	71.7	1.5
Chugoku	73.6	73.0	0.6
Shikoku	73.9	81.0	7.1
Kyushu	81.0	79.2	1.8
Average	76.6	74.9	1.7

Table VI Implantation of DDD Pacemakers

	1985	1984	Difference
Hokkaido	92	53	39
Tohoku	142	83	59
Kanto	474	439	35
Tokai	117	123	-6
Koshinetsu	94	95	-1
Hokuriku	57	29	28
Kinki	384	284	100
Chugoku	155	144	11
Shikoku	20	17	3
Kyushu	223	120	103
Total	1758	1387	371

up 1.7% over the previous year.

6. Implantation of DDD Pacemakers (Table VI)

1,758 dual chamber units were implanted, showing a 25.7% increase over the 1,387 units of 1984.

7. Ratio of DDD Implants to Total (Table VII)

Dual chamber units comprised 23.6% of all implants in 1985, up 3.8% over 1984 when it was 19.8%.

8. Implants per Million Population (Table VIII)

61 pacemakers were implanted per 1 million population. This represents only a marginal growth over 59 per million of 1984.

Table VII Ratio of DDD Implants to Total

	1985	1984	Difference
Hokkaido	18.2%	8.6%	9.6%
Tohoku	19.2	13.2	6.0
Kanto	23.5	23.4	0.1
Tokai	21.4	23.3	-1.9
Koshinetsu	24.2	26.5	-2.3
Hokuriku	22.0	13.2	8.8
Kinki	29.8	25.8	4.0
Chugoku	26.3	24.5	1.8
Shikoku	7.3	6.6	0.7
Kyushu	27.4	14.5	12.9
Average	23.6	19.8	3.8

Table VIII Implants per Million Population

	1985	1984	Difference
Hokkaido	101	109	-8
Tohoku	82	65	17
Kanto	56	52	4
Tokai	42	39	3
Koshinetsu	77	66	11
Hokuriku	86	71	15
Kinki	64	56	8
Chugoku	84	76	8
Shikoku	68	61	7
Kyushu	58	58	0
Total	61	59	2

III. Analysis

The 1985 implant data—total implants 7,441, 61 per 1 million population—would seem to indicate a deceleration in the growth of pacemaker implantation compared to the previous years. Considering this year's lower response rate to the survey, however, it can be assumed that the actual growth rate in 1985 was much higher. The ratio of initial implants to replacements showed little change over the previous years, but the ratio of

dual chamber units rose, indicating the rapid acceptance of more physiological pacing.

REFERENCES

1. YOKOYAMA M, HORI M: A survey of pacemaker implantation in Japan-1983. *Jpn Circ J* 49: 1052, 1985
2. YOKOYAMA M, HORI M: A survey of pacemaker implantation in Japan-1984 *Jpn Circ J* 49: 1108, 1986