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National programme of prosthetics and orthotics in Japan*

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As part of the progress made in the rehabilitation of the physically handicapped in Japan, an increasing interest has been given to prosthetics and orthotics over the past ten years.

The national associations in prosthetics and orthotics can be seen in Table 1.

Table 1
National associations in prosthetics and orthotics

1939:	Japanese Association of Prosthetic and Orthotic Industry. (President Mr. Tasawa.)
1968:	Japanese Society of Prosthetic and Orthotic Education, Research and Development.
1971:	Committee of Prosthetics and Orthotics in the Japanese Association of Rehabilitation Medicine. Chairman S. Sawamura M. D.
1973:	Committee of Prosthetics and Orthotics in the Japanese Orthopaedic Association. Chairman H. Tsuchiya M.D.
1974:	Japanese National Member Society of ISPO. (President T. Amako M.D.)

The Japanese Association of Prosthetic and Orthotic Industry, founded in 1939, consists of 300 manufacturers, of which the total number of prosthetic and orthotic technicians are estimated to be 5,000.

In 1968 doctors, engineers and technicians got together to form the Japanese Society of Prosthetic and Orthotic Education, Research and Development. This society, having 500 members, holds meetings twice a year and publishes a journal.

In 1974 a branch of ISPO was founded in Japan, and this has led to an active exchange of information with foreign countries. To date its members number about 80.

On the medical side committees of prosthetics and orthotics were formed; firstly in 1971 within the Japanese Association of Rehabilitation Medicine and secondly in 1973 within the Japanese Orthopaedic Association.

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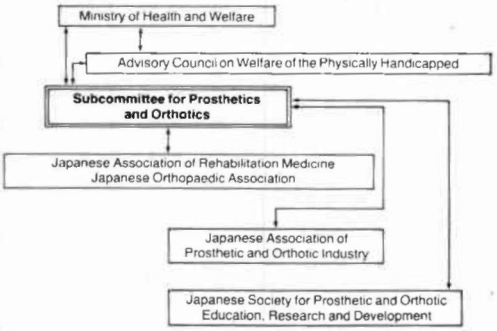
Table 2
Government activity in prosthetics and orthotics

1949:	Legislation for the welfare of the physically handicapped.
1956:	Short-term course for prosthetic technicians. (2–3 weeks, Supervisor Mr. U. Iida).
1970:	Long-term course for prosthetic and orthotic technicians (2–3 years).
1973:	Revised legislation on the Fee, Title and Kind of Prosthetics and Orthotics.
1973:	Postgraduate training course for medical doctors (2 weeks).
1974:	Subcommittee for prosthetics and orthotics.
1975:	Trade skill test for prosthetic and orthotic technicians.
1976:	Committee for prosthetics. (Ministry of Labour) (Chairman: Dr. Amako).

In addition to the activities taking place in the various societies, the Ministry of Health and Welfare has also been active in the field of prosthetics and orthotics (Table 2). It now conducts training courses for prosthetic and orthotic technicians and, at the same time, a training programme in prosthetics and orthotics for doctors is organized by them every year in co-operation with the Japanese Orthopaedic Association and the Japanese Association of Rehabilitation Medicine.

Table 3
Relationship of Subcommittee for Prosthetics and Orthotics to Ministry of Health and Welfare and National Associations



*Based on a paper presented at the Second World Congress, ISPO, New York, 1977.

Table 4

Number of physically handicapped

	Total number of the physically handicapped (A)	Number of handicapped in limb or body (B)	B/A	Rate of (A) to 1,000
1955	785,000	476,000	60%	14·4
1960	829,000	486,000	58%	13·7
1965	1,048,000	610,000	58%	15·7
1970	1,314,000	763,000	58%	17·9
1975	2,005,000	1,303,000	64%	19·2

Starting in 1976 the Ministry of Health and Welfare founded a Subcommittee for Prosthetics and Orthotics within the Advisory Council on Welfare of the Physically Handicapped (Table 3) in order to reflect the public trend. It holds meetings about twice a year to discuss various problems, some of which are outlined below.

Number of physically handicapped

The number of physically handicapped adults in Japan continues to increase every year, the ratio of those who are handicapped in limb or body is shown in Table 4.

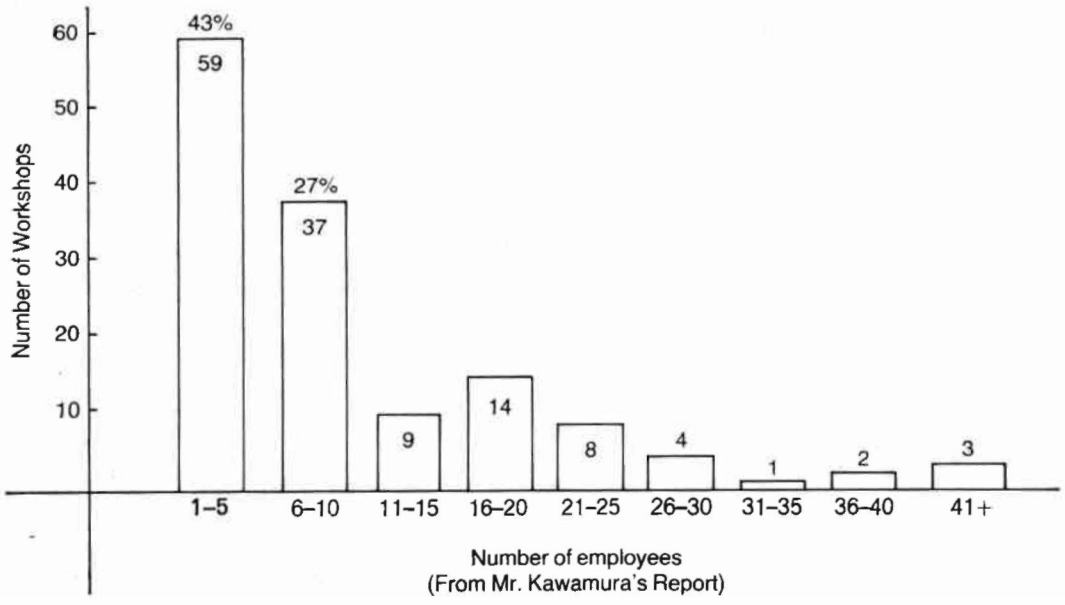
In 1975 the Japanese Medical Society of Rehabilitation, headed by a group of doctors who belong to the prosthetic and orthotic committee and assisted by the prosthetic and orthotic technicians, carried out a fact finding survey of the amputees. The result demonstrated that the total number of amputees operated on that year was 1,394, out of which the number of arm amputees was 441 and that of leg amputees was 953.

Males overwhelmingly outnumbered females in both arm and leg amputation by the ratio of 3·5:1 and 4·9:1 respectively. Eighty per cent of the arm amputees were skilled male labourers and farmers, who suffered trauma.

As for the leg amputees, a large proportion were found to be elderly, with 50 per cent over 50 years. Seventy per cent of leg amputations

Table 5

Number of employees in each workshop



were due to trauma, for example, accidents at work and injuries received during the war.

Amputations due to the disturbance of blood circulation occupied only 8·5% of the male amputees and 2·5% of the female amputees, which is quite different from those of other countries.

Problem of qualification of prosthetists and orthotists

While the statistics gathered by the Ministry of Health and Welfare show an increase in the number and cost of prosthetic and orthotic appliances provided, qualification of prosthetic and orthotic technicians has not yet been standardized. Many of the factories are operated on a small scale, with no more than 5 workers (Table 5). As for educational background, high school graduates occupy 44%, and college graduates occupy only 6% (Table 6) of the total number of technicians working in the prosthetic and orthotic industry. Under the current situation most employees work under apprenticeship, living in the master's house, after they have finished compulsory education.

Table 6
Educational background of prosthetic and orthotic technicians

	College Graduate	High School Graduate	Primary School Graduate
Japanese Association of Prosthetic and Orthotic industry (1973)	83 (6%)	613 (44%)	715 (50%)
Public Institutes	2 (3%)	35 (46%)	39 (51%)

(From Mr. Kawamura's Report)

With the increase of information coming from abroad, there is a growing demand for the training of manufacturers of prosthetic and orthotic appliances and the government is now studying a system of qualification.

Since 1976 the Ministry of Labour gives a certificate examination for the prosthetic and orthotic technician. This examination is given at two levels, each including a written test and a skill test.

In the meantime, the establishment of a training school for prosthetists and orthotists, along with the qualification problem, is under discussion. A course of about three years to be given to high school graduates is being considered, however, it is likely to take a little time before it takes a concrete shape.

Standardization of prosthetic and orthotic appliances

In Japan no institution which evaluates the standards and performance of prosthetic and orthotic appliances has been established. For the past three years, the Ministry of International Trade and Industry has taken a leading part in the standardization of parts of prosthetic and orthotic appliances.

As for technical terms, unification has been tried out, in prosthetics in 1976 and in orthotics in 1977, and a draft is now under way.

Establishment of limb fitting centres

As the actual situation in the field of prosthetics and orthotics has become clear, a plan to establish limb fitting centres has been proposed and is now under discussion. Firstly, Japan is divided into several regions and a centre is to be set up in each region. It is to be provided with sufficient staff and equipment to distribute prosthetic appliances, to check and examine the fitting and to follow up the result. This project is considered to be one of the most important projects in this field.

Development of prosthetic and orthotic appliances

Japan falls behind many other countries in the development of prosthetic and orthotic appliances. However, for several years, prosthetic appliances of modular type have rapidly come into wide use. For the externally-powered upper limb prostheses, besides the YM Hand reported at ISPO, upper extremity prostheses of the total arm type using voice control and microcomputer are being manufactured for trial and an attempt to put their various parts into practical use is in progress. A motorized wheelchair is also under active development. While such developments are under way, 80% of hooks used for upper limb prostheses are imported. The same is also true of knee mechanisms of lower limb prostheses of the modular type. Moreover, the method of

distributing these foreign-made prosthetic appliances leaves much to be desired.

Recently, besides prosthetic and orthotic appliances, the development of various equipment for the physically handicapped, such as a telephone for the blind and a total environment control system, is being pursued on a large scale.

It is anticipated that some of the problems outlined above will be solved in the near future.