

INTERNATIONAL COOPERATION IN TERMS OF PROSTHETICS AND ORTHOTICS EDUCATION

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The purpose of this paper is to share the understanding of international cooperation in terms of Prosthetics and Orthotics currently taking place in developing countries, with the people concerned at Niigata University of Health and Welfare which is going to establish a new department, Prosthetics & Orthotics, and Assistive Technology in 2007. In the first part of the paper, the overall current situation regarding people with disabilities who need prosthetics/orthotics devices is introduced. In the second part, prosthetics and orthotics education taking place in developing countries is described, based on what the writer has been involved with in the past 3 years in Thailand and the other countries. In addition, the writer's perspective about a possible key to success in international cooperation regarding P&O education is described as a summary.

NEED FOR PROSTHESES AND ORTHOSES

The World Health Organization (WHO) reported in 2004 the situation of developing countries where people with physical disabilities need prosthetics and orthotics services as follows¹⁾;

- Persons with physical disabilities, who have a need for prosthetics/orthotics and related rehabilitation services in developing countries, represent 0.5% of the population.
- There are 5.1 billion people in Africa, Asia and Latin America so there will be 25.5 million people in need of prosthetic/orthotic devices.

-The vast majority of these people can remain free of the burden of deformities or can re-establish participation in society if provided with appropriate prosthetic/orthotic devices.

By the year 2010 the combined population of Africa, Asia and Latin America will be approximately 6 billion. The estimated number of people in need of prosthetic and orthotic devices will be 30 million.

RELATED ORGANIZATIONS

Although it is quite important that the personnel providing prosthetics and orthotics services should have an adequate level of education and training, infrastructure development is required prior to the resolution of other issues in developing countries. In most of cases, there is a chronic shortage of local government budget in developing countries for setting up and running a prosthetics and orthotics training course. Therefore, such international organizations as described below have been getting involved in cooperative work in the P&O fields. Although there are many such organizations in the world, this paper covers only a few of those organizations and their activities like the following;

The International Committee of the Red Cross (ICRC) was established in 1863 as an impartial, neutral and independent organization whose exclusively humanitarian mission is to protect the lives and dignity of victims of war and internal violence and to provide them with assistance²⁾.

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| Category | Nomenclature | Normal Minimum Entry | Training |
|--|--|--|--|
| Category I | Prosthetist/orthotist (or equivalent term) | University entry level | 4 years formal structured education leading to University degree (or equivalent) |
| Category II | Orthopaedic Technologist | Usual national requirement for paramedical education | 3 years formal structured education lower than degree level |
| Category II (Lower limb prosthetics) | Lower limb prosthetics technologist | Usual national requirement for paramedical education | 1 year formal structured education plus clinical experience in only lower limb prosthetics to Category II level |
| Category II (Lower limb orthotics) | Lower limb orthotics Technologist | Usual national requirement for paramedical education | 1 year formal structured education plus clinical experience in only lower limb orthotics to Category II level |
| Category II (Upper limb prosthetics/ Orthotics and spinal orthotics) | Upper limb prosthetics/orthotics and spinal orthotics technologist | Usual national requirement for paramedical education | 1 year formal structured education plus clinical experience in only upper limb prosthetics/orthotics and spinal orthotics to Category II level |
| Category III (not a service provider) | Technician (bench worker or equivalent term) | Usual national requirement for technician training | 2 years formal structured or 4 years on-the-job or in-house training |

FOOTNOTE:

Component manufacture is an industrial production process which does not normally involve the above categories.

Table1: Types of personnel¹⁾

With respect to P&O, the ICRC has set up a fund, the Special Fund for the Disabled (SFD), in order to ensure continuity of former ICRC programmes for populations affected by conflict or war and to support other physical rehabilitation centres in low-income countries. Its immediate objectives are to increase access to, and to maintain the quality and durability of rehabilitation services, through a combination of material, financial, technical and training support to assisted centres. The ICRC's SFD annual report 2005 describes its activities in terms of the assistance for disabled people which have taken place in the year as follows³⁾;

- Contributed to the rehabilitation of more than 16,000 persons worldwide: 9,649 were fitted with prosthesis (40% of the assisted amputees were mine victims) and 6,707 with an orthosis.
- Provided material, financial, technical and training support to 53 physical rehabilitation centers in 26 countries. These include newly started assistance projects in Djibouti, Madagascar, Malawi, Mozambique, Namibia, Zambia, El Salvador, Nicaragua and Vietnam.
- Sponsored 13 local staff members from 5 centres to attend one-to three-year courses at regional schools in prosthetics and orthotics. In addition, ten one-month basic training courses

for 56 participants from 19 countries were organized at the SFD regional training centre in Addis Ababa, Ethiopia. In addition, four regional seminars for professionals were organized in cooperation with prosthetic/orthotic schools in Mali, Morocco and Kenya.

Handicap International (HI) also exists to support the needs of disabled people in countries affected by poverty and conflict. They provide both emergency relief and long term development support. HI's mission consists of the following five major elements⁴⁾:

- Prevention: HI aims to eliminate preventable causes of disability.
- Rehabilitation: HI aims to meet the needs as well as the rights of disabled people.
- Inclusion: HI is working towards the full inclusion and participation of disabled people in all aspects of life.
- Capacity Building: HI works with partners, such as local service providers, or local direct product profits, to increase their capacity to provide service for, and to champion the rights of disabled people.
- Emergencies: HI provides post-emergency relief to people disabled by natural or human disasters.

There are some common activities between those two organizations in terms of P&O, for example they provide P&O services directly to people with disability, and contribute to training P&O personnel by providing mainly on-the-job instruction. In addition, they also provide P&O components for some regional P&O schools free of charge in developing countries. There are other organizations which are implementing activities similarly to the two organizations above, for example Veterans International (VI).

The Cambodia Trust (CT) is one Non-Governmental Organizations (NGOs) which has been contributing in P&O fields, being funded by the British Government and other donors. The CT's aims are to restore mobility, to promote

equal rights, and to build capacity⁵⁾. At present, the CT has set up and been running two P&O schools in the South East Asia region to provide Category II level P&O personnel, the Cambodian School of Prosthetics and Orthotics (CSPO) and the Sri Lanka School of Prosthetics and Orthotics (SLSPO). The CSPO is the first P&O School established by the CT, in 1994 in Phnom Penh. In Cambodia alone, there are an estimated 40,000 landmine accident survivors and 50,000 people disabled by polio. The aim of the CSPO is to create a foundation of sustainable physical rehabilitation services, by producing qualified specialists with the skills and knowledge to provide support for disabled people in Cambodia and other developing countries⁶⁾.

The Nippon Foundation (NF) is also funding and supporting some projects and schools in terms of P&O in developing countries. The NF is an independent, non-profit, grant-making organization founded in 1962. It was established by legislation that set aside 3.3 percent of the revenues from motorboat racing to be used for philanthropic purposes. The NF is providing aid to projects that include any of the following four major categories⁷⁾:

- Public welfare in Japan
- Voluntary programs in Japan
- Maritime and ship-related projects
- Overseas cooperative assistance

The NF's support in terms of P&O in developing countries is included in the last category, overseas cooperative assistance. Currently the NF is funding directly or indirectly three P&O schools and three P&O centres in South East Asia. The NF is also one important donor funding the CT as well.

As described above, in general there are two major support methods used by international organizations to meet P&O needs. One is to provide P&O services directly to disabled people in developing countries using expatriates who work for international organizations such as

ICRC and HI. This can efficiently and quickly provide support, especially in urgent situation such as just after disaster or conflict. However, this method lacks sustainability of P&O provision which tends to be a problem after the expatriates' withdraw from the country. The other method is local capacity building. Although training local P&O providers/trainers usually takes much more time than quick P&O provision given directly by expatriates, once local capacity has been built up, those local people are able to run P&O provision systems continually in the future, without any assistance. For example, the CT and the NF are actually supporting some projects in order to train providers/trainers and to build up local capacity through setting up P&O schools.

NEED FOR P&O PERSONNEL

To provide the necessary quality of prosthetics and orthotics services, it is important that the personnel providing them should have an adequate level of education and training. According to a WHO estimate, there should be 180,000 personnel to provide services in prosthetics and orthotics by the year of 2010. In addition, approximately 40,000 personnel are needed to be trained at the Category I or Category II level of prosthetics and orthotics education defined by the International Society for Prosthetics and Orthotics (ISPO). There are approximately 24 schools of varying levels and standards in developing countries which train personnel qualified in some measure to fit, fabricate and assess the biomechanical function of orthopaedic appliances. They graduate no more than 400 personnel per year for all developing countries. It is clear that the existing training arrangements are totally inadequate in comparison to the need. More than 75% of developing countries have no prosthetics and orthotics training programmes which leads to a poor availability of prosthetics and orthotics services¹⁾.

TYPES OF P&O PERSONNEL

The ISPO published an information package in 1998 in order to provide guidance for any country or organization involved in the establishment of a course which will satisfy the standards of the ISPO with respect to the training of Category I professional workers. Thereafter, the standard was revised in 2004. The following Table 1 shows the 3 types of personnel defined by the ISPO. Category I is the level of a professional who should, ideally be able to provide prosthetics and orthotics service within the rehabilitation team. In countries where resources and finances are not available to train all workers to this level, training to Category II level is believed to represent a compromise which will still provide quality service, preferably with supervision by Category I personnel in difficult cases. Category I personnel are educated and trained in all areas of prosthetics and orthotics practice and related rehabilitation issues whilst Category II personnel are educated and trained in only the major areas of prosthetics and orthotics which are commonly needed⁸⁾.

WHAT IS HAPPENING IN SOUTH EAST ASIA

Some countries in South East Asia, such as China, Vietnam, Cambodia, Thailand, Malaysia and Sri Lanka, have their own P&O school(s). As far as is known, three of them have a 4-year programme, and the other schools have a three-year educational course. Except for Hong Kong Poly Tech University, all of them are being supported more or less by some international organization. China Training Centre for Orthopaedic Technologists (CHTCOT), Vietnamese Training Centre for Orthopaedic Technologists (VIETCOT), and apparently Malaya University in Malaysia have been supported by a German governmental organization; GTZ, in financial and/or technical aspects. And the other schools; CSPO, The Sirindhorn School of Prosthetics and Orthotics Mahidol University in Thailand, and the

SLSPPO have been funded by the NF and/or the CT. Among them, the CSPO's activities are noticeable and significant. The CSPO has a ten year history, and in its first half they were actually focusing on producing Cambodian P&O personnel to meet their own country's needs, but now they are contributing to other countries with a similar situation to Cambodia. The CSPO has been receiving students from abroad such as Afghanistan, East Timor, Georgia, Indonesia, Iraq, Lao PDR, Malaysia, Myanmar, North Korea, Pakistan, the Philippines and Sri Lanka, as well as Cambodia, being funded by the CT and the NF⁹). This activity can be described as a typical and advantageous South-South collaboration. In addition, the CSPO has been playing an important role as a key school which initiates external activity such as the Regional P&O School Meeting, since 2003. Mary Scott, Principal of the CSPO, originally put forth the idea in 2003 to have a meeting among representatives of regional P&O schools in South East Asia in order to exchange teaching skills and knowledge, and to discuss other related issues. The NF has agreed with the idea and decided to provide financial support for the meetings. The 1st meeting was held at the CSPO, Cambodia in early 2004, and 12 representatives of five schools attended. The 2nd meeting was held in Peshawar, Pakistan in late 2004. And the recent 3rd meeting was held at the School of Mahidol University, Thailand in 2005. Through those meetings, the writer, as one of the attendees, has realized the importance and fruitfulness of creating a firm connection between P&O schools. Now, they are not only having meetings but also exchanging their lecturers for one month in order to understand each other and each school's situation.

A CASE OF THE P&O SCHOOL IN THAILAND

The writer has worked for Sirindhorn School of Prosthetics & Orthotics, Mahidol University (MU) from 2003 to 2006 as a Certified Prosthetist and

Orthotist (CPO) expatriate. Since 2002, MU and Sirindhorn National Medical Rehabilitation Center (SNMRC) have been running the school together, being funded by the NF. The following is the outline of P&O context and the project for the establishment of the P&O School in Thailand. Thailand is located in Southeast Asia bounded by Myanmar on the west and north, Laos on the north and northeast, Cambodia on the east and north east, and Malaysia on the south, and is approximately the same size as France, or 513,120sq.km with a population of 62 million. According to some health related surveys, the proportion of disabled people in Thailand varies approximately from 1.8% to 8% of the total population, ranging from 1.5 to 5 million people with disabilities. One survey done by the Ministry of Public Health in 2001 identified the number of patients related to P/O as follows¹⁰;

- Upper limb amputees; 66,000-
- Lower limb amputees; 55,000-
- Joint contractures in upper/lower limbs; 167,000-
- Spinal deformities; 45,842-
- Paralytics; 160,000-

The project "Establishment of the College of Prosthetist-Orthotist Bachelor's degree, Thailand" has been placed at the SNMRC in 2002 to set up and run the P&O programme at the Faculty of Medicine, Siriraj Hospital, MU with financial assistance from the NF. The project objectives are;

- ①To produce 20 graduates holding a bachelor's degree in P&O each year
- ②To build local capacity (P&O instructors)
- ③To provide a curriculum syllabus accepted by the university and ministry council
- ④To standardize P&O educational facilities
- ⑤To provide P&O working positions accepted by the National Committee of Civil Servants

The role of each organization is:

- MU owns the P&O programme as an educational institution under the Ministry of

Education, and provides the graduates with a bachelor's degree.

■SNMRC has been granted by NF in order to hire temporary school staff, such as CPO expatriates, to purchase the required tools, machines and materials for the P/O practices of the program, and to send young Thais to some P&O schools abroad, such as Strathclyde University. In addition, working with the Ministry of Public Health in order to expand the P&O job opportunities in Thailand for graduates is one of the important missions of SNMRC.

With regard to the P&O programme, the current 4-year P&O curriculum was originally designed by the professors at the faculty and an expatriate advisor in 2002. P/O practical or theoretical hours are allocated approximately 60% of the 3,721 hours of the 4-year curriculum, and are concentrated in the 3rd and 4th year curriculums. General and medical subjects are taught by the university's lecturers and doctors; all of the P/O sessions are conducted by CPO expatriates. One of the strengths of the programme is that the school is attached to the medical school and the hospital. This situation enables the students to be educated as health care professionals in the ideal environment. The curriculum contains three types of the P&O training; General Modules, Clinical Practices, and Clinical Placement. They enable each student to obtain serially the required P/O skill and knowledge before they start dealing independently with patients in clinic. Learning opportunities given by the CPO expatriates from 5 nations would also benefit the students not only in P&O technical aspects but also in the cultural aspect. However, there are some problems the educational members are facing in terms of education as follows;

■Defects of the curriculum structure; ①Late starting of the P/O subjects, ②Lack of connection between the specific P/O subjects and the other subjects, ③Tight schedule of the 3rd and 4th year curriculum

■Language spoken in the sessions (Thai or English?)

■Discrepancy between the school education and the current situation in clinic

The first phase of the project was terminated at the end of March 2006. It is therefore the proper time now for project staff to review the past four and a half years, checking each project objective set up at the beginning.

①The school provided the first 10 graduates in 2006. And they have obtained a P&O job in the county.

②The local capacity that was expected to be local instructors has not built up yet. (None of the students abroad has finished a degree yet.) Thus, the school has to continue to rely on some CPO expatriates to teach the students.

③Regarding the current P&O curriculum and its syllabus, it is a common understanding among the academic staff that there are a lot of issues, such as the above, to be improved, reflecting the outcome of the past four years.

④Lack of P&O positions in Thailand is one of the serious problems that the future graduates will be facing. And there is concern that this would also discourage the undergraduates.

It is obvious that a P&O programme which is able to provide reliable P&Os has its significance in terms of health care in Thailand. And the school is also expected to play a role as a key P&O school in Southeast Asia in the future. On the other hand, the school is still in its infancy and far from "True Establishment". The three organizations therefore need to collaborate continually to run and improve the programme.

KEY ELEMENTS

The first part of this paper clearly mentions that is a huge need for P&O personnel who are able to provide quality P&O services, especially in developing countries. It has also described that, for producing qualified P&O personnel, it would

be necessary to set up a P&O educational course following ISPO standards, in developing countries where local government budgets are running out. And, therefore some international organizations participate to support P&O schools in both technical and financial aspects. Most of the P&O schools in those countries need to be given expatriates' technical support and external funding more or less until the time when local capacity is built up adequately. Through the experience in the past three years of being involved in the establishment of the Bachelor Programme in P&O in Thailand, the writer, as an expatriate, has realized that there are some key elements required to succeed in setting up and running a P&O school in developing countries.

Firstly, even though you have enough budgets donated by donors, it is quite risky to start a project in a hurry simply based on the large number of people who need P&O services in the subject country. You should not hesitate to spend time doing surveys in order to grasp the real situation of the country. The following information could help you to consider correctly how a prospective school should be created to meet the country's needs.

- Country information in general; Climate, Culture, Religion, Language spoken, People's life style, Economy, Political condition
- Educational system
- Medical care system and level of professionals aligned with health
- Needs for P&O service
- Needs for P&O personnel
- Presence of counterparts and available human resources
- Involvement of and backup from local government
- Possible other international organizations' involvement and/or support

Once these issues have been confirmed, then you would be able to set up a specific plan and suggest it to project donors. You must keep in

mind that your plan must describe clearly a specific goal of the project. General speaking, taking over of the school by local people would be a common goal in each project.

Secondly, project members must think carefully of two major practical issues before having students enter the school. One is about "Language", and the other one is "Appropriate technology". As long as expatriates teach local students instead of local trainers, there will be a language barrier between them. Especially in South East Asian countries, most people speak their local language, and English is not their mother tongue. So, consideration of a solution for this should be crucial. And to think about appropriate technology, in terms of P&O specifically, would be one of the keys for providing proper training for local personnel. Although there are various types of P&O components available in industrial countries, there are few choices in developing countries. Thus, CPO expatriates must think of what kind of P&O technology would be appropriate in the subject country.

Finally, when some international organization runs a school in a developing country, the local government's involvement is always needed and crucial. Proper organization of the project and multiple collaboration are also very important to ensure the sustainability of the school.

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