Prosthetics & Orthotics A Personal View From Cambodia

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Landmine victims have been the focus of attention since the formation of the International Campaign to Ban Landmines (ICBL), and this naturally peaked in 1997 with the signing of the Ottawa agreement. This event, while incredible, needs to be looked at as part of an ongoing process in the rehabilitation of people with mobility impairment living in low income. These are often considered as only landmine victims, but the context is wider. While the continuing work of ratification, awareness raising, advocacy planning etc. goes on, it is useful to look at the context of the ongoing work in rehab, the lessons learned and the challenges still to be faced.

The work in victim assistance (VA) is dynamic, a pillar with little history. The prosthetic industry as we know it today in the developed world is little more than 35 years old. We are learning and the countries themselves are learning. We have no need however to reinvent the wheel when it comes to planning; so much has been done already.

For the past six years I have worked in Phnom Penh, Cambodia, with a small British organization called The Cambodia Trust. Cambodia is well known to many as one of the world's most densely landmined countries. It has suffered nearly 30 years of war, as the conflict in Vietnam spilled across its borders, but is also infamous for the Pol Pot regime in the mid-70s. After that dark period the country was isolated from the international community until the late 80s making it desperately poor and under developed. The intellectual middle class had been wiped out by the genocide leaving a largely peasant population where literacy was virtually zero. The Civil War, post-Pol Pot, lasted until the Paris peace accord in 1992, and up until earlier this year there was still sporadic fighting and dislocation as the hard-liners held out in the jungles. As a result the country is extremely poor, civil society is embryonic, and education standards are low. More than 80 percent of the population are subsistence farmers with little access to a cash economy. It is against this backdrop that some 160 organizations, including Cambodia Trust, are working.

The trust has been working in Cambodia since 1992 and has developed three prosthetic service centers under the auspices of the Cambodia Trust Rehabilitation Project in Kompong Som, Kompong Chanang and Kieng Svey. It is the largest service provider in Cambodia, producing more than 1,200 prostheses and 400 orthoses in 1997-1998. The trust's largest project, The Cambodian School of Prosthetics and Orthotics (CSPO), which includes a large rehab clinic, is based in Phnom Penh, the capital. The CSPO is the national training scheme for Prosthetics and Orthotics (P&Os) and works in collaboration with five other organizations: American Friends Service Committee (AFSC), Handicap International, Veterans International, American Red Cross and International Committee of the Red Cross, and of course with the government of Cambodia to build human resources in that country. The school has been working very closely with the International Society for Prosthetics and Orthotics (ISPO) to bring the curriculum within the guidelines set down by ISPO in October 1997, for the training of Category II Orthopedic Technologists, or prosthetist orthotists.

Status of the CSPO

The CSPO opened its doors in 1994 with an intake of six students. In subsequent years the intake has risen to 12 and as a result we have now three graduating classes with 27 new Prosthetist/Orthotists and another 43 in the pipeline. As we reach our initial estimated 1993 target of 60 graduates for the Cambodian service, we have looked more seriously at developing a regional role, and for the first time, last year, we took two students from the Lao Peoples Democratic Republic. This year we have six from Laos, two from Sri Lanka and one from the Solomon Islands. The remaining three are Cambodian. One possible future for the CSPO is that we generate income by taking in fee-paying overseas students while retaining a small number of cheap or even free places for Cambodians. This would allow us to maintain the
Disability in Low-Income Countries

In mine-affected countries such as Cambodia, the vast majority of disabled people are young. Mine-victim amputees are virtually all in their 20s, with up to 70 percent of them being injured military personnel.

Cambodia has a young population, an adult life expectancy of less than 50 years, and a high birth rate, which makes the under-18 population more than 60 percent of the total. So the requirements for the performance of a prosthesis or orthosis is very different to that of the developed world. To begin with, the standard of amputation is often low, resulting in a stump with poor distal soft tissue or adherent scar, or with general poor skin cover. The nature of landmine injury is such that amputation is done in several stages. The initial damage to the limb may look generally small but it is usual to find that actual subcutaneous damage extends much further than external inspection may indicate. The hot, high pressure gases associated with the blast will have inflicted the limb prior to the rupture of the skin so causing what might be described as a delamination type of injury not readily observable. Dirt and foreign materials will be driven with great force into the limb, so giving great concern for infection. So the normal method of treatment is the so-called "open amputation" where the stump is left untreated for several weeks while daily debridement is carried out. Closing the stump before all foreign objects have been removed very seriously increases the risk of infection.

The procedure is not well suited to giving good results in myeloid, so resulting in poor distal end. As a result the procedure is not usually not able to be the fable one. It is designed to make because the sight and sound of a seriously wounded but still conscious colleague is infinitely more morale sap- ping than the truth of a clearly killed one. The infrastructure needed to rescue, treat and transport the wounded far exceeds that of disposing of a corpse. The cost is low and the effectiveness so high, no wonder it is nicknamed "The sentry who never sleeps."

International Standards in Training of Staff

This problem has been haunting us at CSPO since the very beginning. Some agencies feel the criteria are too strict and use some sort of prosthetic/orthotic colonization. Some feel that the time periods of training are too long and that prosthetists/orthotists should be trained in a matter of months. Some feel we are being forced to accept a first-world standard that could not possibly be achieved in the Third World. Some think the standards can only be achieved by organizations with multimillion-dollar budgets. The above are not true, we have proved it.

The setting and achievement of international standards are always important. Standards are by definition benchmarks; they are reality checks, mechanisms by which we assess our own progress, and especially by which we check our route map. The process of setting up education standards began in 1984 and was carried up to the present day. It has focused the minds of those who educate as well as those who pay for education, giving clear direction to governments, non-governments and donors alike. I believe that the education standards set by the International School of Prosthetics and Orthotics (ISPO) are probably the most enduring legacy left by this body to the disabled of the developing world. How good it would be to see the same rigorous standards applied in the training of developed world practitioners.

Appropriate Prosthetic Technology

In 1995 the ISPO, with the U.S. Agency for International Development funding, held a conference in Phnom Penh to look closely at the vexed question of appropriate prosthetic technology for the developing world. This discussion had raged for several years, with various agencies adopting wildly differing views on just how we could deal with the huge numbers of limbless in the world. I first became aware of the dispute in 1993 on arrival in Cambodia, having naively assumed that the PC&O community would be one big happy family united by the cause. There were, at that time, seven agencies and it seemed almost as many different technologies in use.

Jaiipur Limb

The Jaiipur Limb as favored by Veterans International is vigorously defended as the only appropriate technol- ogy in the world. The Jaiapur Prosthetics cover is an aluminum exoskeletal device made by a technician who is trained as an artisan and not as a prosthetist. The foot is made from local rubber, quite cosmetic but heavy and rather solid. The biggest problem lies in the socket fit, which is made by eye and not to a cast. The open-ended design makes total contact or even lateral distal containment very difficult.

Wood and Leather Limb

The other low technology group at that time was Handicap International, who was the fervent sup- porter of wood and leather technology. The pros- thetic was heavy, uncosmetic and the material was quite inappropriate in wet tropical conditions. The socket fit was dubious to begin with as the heavy leather made it difficult to make an intimate fit with the cast. The fit would then deteriorate further as the socket deformed in exactly the load bearing areas.

Selection of Feet

Prosthetic feet remain a subject of tremendous debate. Naturally there has been considerable work carried out to try and build a foot locally, one that is durable, light and cheap. The importation of west-
ern feet has been inappropriate since the humidity, heat and the local flora and fauna lead to very rapid degradation of the material to natural rubber remains the material of choice. There have been several designs of rubber feet, some using wooden leeches, which are rather prone to rotting and some using polypropylene leeches, which are rather prone to pulling out. As a prosthetist, the main difficulty with these feet is the lack of an effective in vitro heel cushion. The other problem is of course weight, with the device being probably twice that of a standard SACH. This must be placed in the context of a young active population and a price tag of around $4. Much research continues to take place, with recent developments in keel material and shape. Recent innovations include a low profile foot for ankle disarticulation patients and attempts to design in some energy recovery. The low profile foot because of its reduced material content makes quite a difference to the weight problem.

**ICRC System With and Without Cosmesis**

The ICRC, American Red Cross and AFSC occupied the middle of the road. They were committed to a rather nice, locally designed and manufactured modular system. Sockets were in polypropylene (PP) with mild steel components with some made in recycled injection molded PP. This system worked well, and was relatively easy to use. It was designed and built by a team of prosthetists and engineers working together. Over the past few years the system has been refined to make more use of recycled PP and PP & Os. The technical stuff is very short term. So a group of interested NGOs and government staff began a process of altering the thinking of so-called policymakers to the long-term needs of the rehabilitation sector. To cut a long story short, we persuaded the government to set up a task force, which lasted for a year, and in that time we surveyed the country, looked at all the agencies associated with disability and began the process of national planning. Out of that has come a new body called the Disability Action Council (DAC). Since 1997, the future is at least being addressed. The DAC is a semi-government, semi-NGO group developing plans and taking action. There are times when the government is driven and others when inertness and the collapse of the system is in the background. In cases of famine, a few days are spent trying to establish the size of the problem and the amount of relief needed plus supplies required to deliver the service. Money is raised, and the program swings into action. Lives are saved and once the emergency is passed a very short evaluation is carried out so lessons learned in logistics can be transferred to the general system. They establish a well developed and in place, and there are many expert organizations in the world who can execute such measures in a matter of days. It is sad but true, however, that emergencies happen quickly but are solved slowly, so often from emergency relief comes forth development programs. Refugees can rarely return home to wrecked countries without some sort of development assistance or infrastructure investment. Prosthetics and orthotics really fit into the former role model, especially in the scenario where education is involved. Indeed such was the case in Tanzania, Togo and China when the German governments, through GTZ, set up training schools for prosthetists in Saarland. These were relatively stable countries with less of a sense of urgency.反射

**Patient Safety**

The 1995 Ispo consensus conference pointed out that all technologies in use in the Third World should be thoroughly safety tested. New technologies should never be tried out on the poor, who may be available and grateful for anything. They should not be field tested without proper safeguards for all. The consensus conference also noted that expensive solutions could also divert useful resources and so deprive other sectors with disability needs.

**Who Pays and How**

It is normal in the world of international development that projects like ours have a life cycle. They have a beginning, middle and end. In rural development, the beginning is a needs assessment where the communities’ deficiencies are identified and a process of support planned. The middle part is the implementation of the plans and the logistics required to implement the project. The third part is the evaluation. In this the objectives are re-examined, performance indicators applied and the project declared a success or failure. From the final reports, much is learned and the project is continued or repeated. This model is well established.

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**Planning and Developing Sustainability**

In 1995 we were seduced by a great fear. Would the graduates of our little school be able to work in Cambodia in the immediate future and also in the long term? Considerable effort was being put into training and it occurred to us that it was likely that in 10 years time half of them might be employed as tour guides and the other half would be planting rice, a sobering thought. It was a sure bet that the government was not planning for long term and that many of the P&O initiatives were entirely NGO driven and supported, and NGOs are very short term. So a group of interested NGOs and government staff began a process of altering the thinking of so-called policymakers to the long-term needs of the rehabilitation sector. To cut a long story short, we persuaded the government to set up a task force, which lasted for a year, and in that time we surveyed the country, looked at all the agencies associated with disability and began the process of national planning. Out of that has come a new body called the Disability Action Council (DAC). Since 1997, the future is at last being addressed. The DAC is a semi-government, semi-NGO group developing plans and taking action. There are times when the government is driven and others when inertness and the collapse of the system is in the background. In cases of famine, a few days are spent trying to establish the size of the problem and the amount of relief needed plus supplies required to deliver the service. Money is raised, and the program swings into action. Lives are saved and once the emergency is passed a very short evaluation is carried out so lessons learned in logistics can be transferred to the general system. They establish a well developed and in place, and there are many expert organizations in the world who can execute such measures in a matter of days. It is sad but true, however, that emergencies happen quickly but are solved slowly, so often from emergency relief comes forth development programs. Refugees can rarely return home to wrecked countries without some sort of development assistance or infrastructure investment. Prosthetics and orthotics really fit into the former role model, especially in the scenario where education is involved. Indeed such was the case in Tanzania, Togo and China when the German governments, through GTZ, set up training schools for prosthetists in Saarland. These were relatively stable countries with less of a sense of urgency. However at the end of the day the role of government in health care is under debate in many countries. The technical staff is easy for the western countries to take over, but we are well aware of the outside support, but we are also well aware that the shelf life of this outside support has. How long will it be fashionable to support disabled in the Third World once the spotlight of the media issue grows dim?

**So What is the Point?**

In a place like Cambodia, the point is simple: Put people who should be working back to work. The numbers of disabled are disproportionately high and the resources disproportionately low. With the right infrastructure and assistance we can release the potential of tens of thousands of work-aged people to contribute to the development of their own country. The technical stuff is finished, the training also, the buildings are in place and the work begins. The biggest challenge is now being faced, and the objective is new and clear: the disabled are not to be helped; they are to be helped to help themselves.