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## Veterans International Technical and Medical Rehabilitation Support Services in Cambodia

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**VETERANS INTERNATIONAL  
TECHNICAL AND MEDICAL  
REHABILITATION SUPPORT  
SERVICES IN CAMBODIA**

October 2001

Mel Stills, CO  
Kim Dunleavy, MS, MOMT, PT, OCS

The evaluation report was conducted under the auspices of the U. S. Agency for International Development. The evaluation was conducted by Displaced Children and Orphans Fund and Leahy War Victims Fund Contract (HRN-C-00-98-00037-00). The opinions expressed are those of the author and do not necessarily reflect the reviews of the U.S. Agency for International Development or Professional Resources Group International, Inc.

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# Abbreviations

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AAR	Association for Aid and Relief
ADL	activities of daily living
AFO	Ankle Foot Orthotic
AFSC	American Friends Service Committee
AMDA	Association of Medical Doctors of Asia
ARC	American Red Cross
AVI	Australian Volunteers International
CFU	Community Follow-Up
CIOMAL	Comité International de L'Ordre de Malte (International Committee of the Order of Malta for Leprosy Relief)
CPO	certified prosthetics/orthotics
CSPO	Cambodia School for Prosthetics and Orthotics
DAC	Disability Action Council
HI	Handicap International
ICRC	International Committee of the Red Cross
KAFO	Knee Ankle Foot Orthotics
LSO	Lumbosacral Orthosis
LWVF	Leahy War Victims Fund
MOH	Ministry of Health
MOSALVY	Ministry of Social Affairs, Labor, Vocational Training and Youth Rehabilitation
NCDP	National Center for Disabled People
NGO	nongovernmental organization
P&O	prosthetics and orthotics
PFD	proximal focal deficiency
PT	Physical Therapy
PWD	People With Disabilities
TENS	Transcutaneous Electrical Nerve Stimulation
TPO	Transcultural Psycho-social Organization
TSMC	Technical School for Medical Care
UCC	United Cambodia Community
USAID	U.S. Agency for International Development
UXO	unexploded ordnances
VI	Veterans International
VI/C	Veterans International/Cambodia

# Map of Cambodia



Base 802467 (R02153) 12-97

## **Executive Summary**

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The rehabilitation ventures established by Veterans International (VI) in Cambodia that have been funded by the U.S. Agency for International Development (USAID) are providing highly successful and valuable interventions for people with disabilities. The grant support has enabled people with amputations, spinal cord injuries, cerebral palsy, polio, and a number of other pathologies to receive high-quality rehabilitation and prosthetic and orthotic services. Numerous patients have had significant positive functional and social outcomes, with particularly good outcomes for patients with amputations and clubfeet, and good outcomes for those with polio and spinal cord injury. The quality of rehabilitation services for patients with cerebral palsy or for those who have suffered a stroke could be improved.

Rehabilitation services are accessible to individuals with disabilities in three areas at the centers based in Phnom Penh, Kratie, and Prey Veng. An additional unit in the far North (Preah Vihear) is now self-supporting. The coordination of nongovernmental organization (NGO) rehabilitation services in Cambodia through the Disabilities Action Council (DAC) with a variety of subcommittees has been very effective in minimizing overlap among services and ensuring communication between NGOs.

The physiotherapists and P&Os have mid-level professional standards with diploma

entry-level education. The professionals have good technical skills for developing country standards, but lack the flexibility required in situations that involve complex patients or when adequate medical/surgical diagnostics have not been completed. The lack of clinical decision-making skills, lack of solid theoretical foundations, and minimal exposure to a variety of treatment alternatives result in difficulties with efficiency, prioritization, and progression of patient treatment. The professionals employed by VI have the potential to be Cambodian leaders, but will need further professional mentoring and continuing education opportunities to develop their skills.

The community follow-up services are intended to provide accessible support for patients after they have received rehabilitation or delivery of devices. The methods in which these services are delivered are not supporting the intended goal of ensuring the functional goals of the patients are being enhanced. The entire focus of the community follow-up services, communication of goals, personnel delivering services, and assessment of efficacy needs to be revisited.

The medical and surgical support services at the two rural facilities of Prey Veng and Kratie are insufficient to support the needs of the rehabilitation facilities. Developing these services locally would greatly enhance the efficacy of services at these units.



## **SWOT Analysis**

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### **Strengths**

- Strong technical capabilities of prosthetics and orthotics (P&O) staff
- Equipment and facilities to support prosthetics, orthotics, and wheelchair production
- Committed and enthusiastic professional, administrative, and support staff
- Commitment to education
- Well-defined, strong relationships with other NGOs in Cambodia; reduction in duplication of services; and facilitation of cooperative educational ventures
- Strong support for long-term change and growth through the Disability Action Council and the various subcommittees
- Availability of professionals trained at the diploma level in prosthetics and orthotics and physiotherapy
- Provision of rehabilitation services in three rural provinces where the average income is extremely low and the effects of the war are extreme

- Good outcomes for patients with amputations and polio
- Extremely good conservative management outcomes for clubfeet

### **Weaknesses**

- Attempts to provide all-encompassing services are diluting efforts with respect to community follow-up
- Community follow-up service efficacy and efficiency are poor
- Professionals have limited knowledge and skills for treatment alternatives
- Professionals lack higher-level clinical decision-making skills and rely on the rehabilitation supervisor for significant guidance for overall treatment management options in complex cases
- Present professional leadership is spread extremely thin for development of higher-level professional skills

- Lack of medical and surgical support in the satellite areas requires referral of patients to Phnom Penh

## **Opportunities**

- VI has the opportunity to work toward a sustainable, yet high-quality operation providing services for the People with Disabilities (PWD) in Cambodia (see section on sustainability)
- Improving the depth of background knowledge, decision-making skills, and alternative treatment strategies of the professional staff would increase treatment efficiency and alternatives in order to decrease the length of time the patient spends at the center
- Establishing links and referral mechanisms with other organizations would facilitate wider social and community assistance for PWD
- The wheelchair unit is well-managed and could be handed over to local management
- The foot production element of production could be handed over to ICRC
- Kratie has expanded dramatically and will need further expansion (staffing, administration, and support services)
- The intended goal of Kien Khleang becoming a regional rehabilitation center for Cambodia is feasible
- The professional staff have a basic background in both theory, practical skills, and experience, and further development would provide the

opportunity and motivation to become Cambodian leaders

- The involvement with the DAC, the physiotherapy, P&O, administration, and wheelchair subcommittees allows active contributions to shaping the growth of rehabilitation professions in Cambodia and provision of quality services to the disabled population
- Cambodia and provision of quality services to the disabled population

## **Threats**

- Complete reliance on external funding
- The extent of governmental financial assistance is likely to be insufficient for quality operations
- The lack of high-level coordination between NGOs and rehabilitation professionals in
- Cambodia is taking significant time from professional leadership for development of the VI staff
- The focus on community services is draining the development of more acute rehabilitation needs at Kratie
- Medical and surgical services are not readily available at a high enough level to support rehabilitation services at Kratie and Prey Veng

# Introduction

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## Background

Cambodia occupies a territory of 181,035 square kilometers, an area slightly smaller than the state of Oklahoma. The population as of March 1998 was estimated at 11.5 million, of which 169,058 have disabilities according to a report from the DAC<sup>1</sup>. Of that number, 30,721 are amputees. Disabilities due to polio and cerebral palsy are not included in this number, and clubfoot may be grouped into the 50,247 reported congenital disabilities. Spinal deformity is not reported unless it contributes to a disability.

Cambodia has suffered through more than two decades of civil war. Land mines and unexploded ordnances (UXO) have caused thousands of deaths, severe injuries, and amputations. A total disruption of medical services has led to inadequate prevention and management of diseases such as polio. No new cases of polio have been reported, but thousands of small children suffer from the aftereffects of the disease. All of them can look forward to post-polio syndrome that will affect them in later life, as is the case in the United States now. There are also a vast number of disabilities due to inadequate management of trauma (fractures or burns) and a high incidence of infectious diseases related to health awareness/education, malnutrition, poor sanitation, and lack of immunization. Health care officials reported that in some areas of the country, 20 percent of the deaths in hospitals are due to

HIV/AIDS. The exact reason for the high number of birth defects is unclear, but the incidence is reportedly high in the areas of the country that underwent deforestation during the Vietnam War. The birth defects seen during this visit were extreme and severe. Most individuals need surgical attention, but this is not readily available. Severe disability due to spinal cord injury is present, with high mortality rates secondary to preventable complications.

The decades of war in Cambodia not only yielded people with disabilities directly attributed to trauma, but it also destroyed the medical and intellectual infrastructure of the country. As part of a direct approach to eliminate the intellectual leaders, anyone with professional or technical status was killed or driven from the country. Less than 40 medical doctors remained when the war was over, and only 10 of that number remained in Cambodia in 1975 after the Khmer Rouge finished their slaughter of more than 1 million people. This decimating history has left Cambodia with a huge gap in professional education, along with basic educational resources. A vast number of adults have had no high school education and in the rural areas, high schools are rare. It is said that experience comes with age, and Cambodia has a young population. A total of 41.25 percent of the population is below 14 years of age, 55.28 percent are 15-64 years of age, and only 3.47 percent are

above 65 years of age<sup>2</sup>. The educational and development needs of the Cambodian people are therefore hindered both by the lack of educational background of the present teachers and leaders and by the increased demands of a large population.

The rebuilding of Cambodian infrastructure and development of human professional capital was started in the early 1990s, however, it was not until 1998 that political stability returned with the surrender of the last of the Khmer Rouge forces. The road to recovery has been slow, but progress is beginning to be noted in the areas of medical education, due to the cooperative agreement between nongovernmental organizations (NGO) and their Cambodian counterparts.

In addition to the educational status, the governmental responsibility for development of community resources and infrastructure has historically been an issue that sparked some of the conflict leading to the turmoil of the past two decades. A primarily agrarian society with limited financial investment or resources in health care and community development from the government, Cambodia still suffers from the ills of lack of infrastructure and lack of direction of resources. The primary governmental department responsible for rehabilitation is the Ministry of Social Affairs, Labor, Vocational Training and Youth Rehabilitation (MOSALVY). Health services fall under the auspices of the Ministry of Health (MOH). Both of these departments have objectives to

increase and improve the accessibility of services to the population of Cambodia and to eventually provide both financial and management support for rehabilitation services respectively<sup>3</sup>. Presently, rehabilitation services are heavily supported by the NGOs in Cambodia. It may take years before the government of Cambodia is able to take complete responsibility for health services.

In response to the current and growing needs of people with disabilities, VI/C began working in Cambodia and established the Kien Khleang Physical Rehabilitation Center in 1992. The Prey Veng Center was added in 1995, the Preah Vihear Center in 1996, and the Kratie Center in 2000. Current technology includes the use of polypropylene, ICRC plastic componentry, and a comprehensive physiotherapy program. The VI/C centers have treated 14,561 patients and provided more than 11,956 P/O devices, 4,819 wheelchairs, and 142,725 treatments. USAID/LWVF has provided nearly US \$10 million to date, and VI/C is requesting a \$2,700,000 extension for a period of two years from January 1, 2002 to December 31, 2003.

## Evaluation Methodology

A two-person team from the U.S. Agency for International Development's (USAID) Leahy War Victims Fund (LWVF) visited Veterans International/Cambodia (VI/C) from October 1-12, 2001 to assess the impact of the VI/C-implemented technical and medical rehabilitation support services at the Kien Khleang Center, Prey Veng Center, and Kratie Center. The team reviewed project documentation and service delivery programs. In addition, the team observed treatment and service delivery processes at the three facilities and during community follow-up visits. Interviews were conducted with leaders and staff from VI/C, Disability Action Council (DAC), American Red Cross (ARC),

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<sup>2</sup> [www.odci.gov/cia/publications/factbook/geos/cb.html](http://www.odci.gov/cia/publications/factbook/geos/cb.html).

<sup>3</sup> Report from Physical Rehabilitation Subcommittee of the Disability Action Council. "Actual Situation of Physical Rehabilitation in Cambodia." Comparative Study 2001. Report 1. June 2001.

International Committee of the Red Cross (ICRC), Health Net International, Hope Worldwide, Rose Charities, Cambodia School for Prosthetics and Orthotics (CSPO), Handicap International (HI), and the School of Physiotherapy.



## **Major Findings**

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### **Kien Khleang Physical Rehabilitation Center**

This center opened in 1992 and is located just north of Phnom Penh. The Kien Khleang Physical Rehabilitation Center belongs to the Ministry of Social Affairs, Labor, Vocational Training and Youth Rehabilitation (MOSALVY). It has seven departments including Administration, Prosthetics and Orthotics, Physiotherapy and Community Follow-Up, Foot Manufacturing, Wheelchair Research and Manufacturing, Dormitory, and Maintenance and Cleaning.

#### ***Facility***

The facility occupies approximately 7,000 square meters. It is located adjacent to CIOMAL (International Committee of the Order of Malta for Leprosy Relief) Leprosy Treatment Center, Rose Surgery Center, and AAR (Association for Aid and Relief) Vocational Training and Wheelchair Manufacturing. The adjacent NGOs cooperate with respect to negotiating for facility services such as water supply, with occasional reciprocal collaborations such as patient referral for orthotic services or minor surgery. VI/C services are located in four different buildings. The main building houses the prosthetic and orthotic manufacturing and physiotherapy treatment areas. The dormitory and kitchen are located in a second building. The maintenance department is located in the

third building, and the fourth building is a Khmer-style bamboo home used for activities of daily living (ADL) training.

The evaluation visit took place at the end of the monsoon season during which the unusually high rainfall had resulted in widespread flooding. The area leading into the compound was flooded with about one foot of water during the team's visit. The building area of the Kien Khleang compound was dry, but one of the outdoor areas used for gait training and the Khmer ADL home was not accessible due to accumulated water.

The prosthetic and orthotic sections are well organized and appear to have adequate space for the current workload. The fabrication facilities are well equipped and are maintained in proper order. The assessment and casting areas are separated from fabrication spaces. They are well maintained, clean, and well organized. The current space, equipment, and facilities could accommodate moderate increases in production needs.

#### ***Accessibility***

Rehabilitation services are available to those in need both in terms of expense and accessibility. Families are reimbursed for transportation costs to all the centers, and dormitories, food, and prosthetic/orthotic devices are free. Rehabilitation is free, and if medical services are required, other resources

are investigated or subsidized by the centers. During the rainy season, the roads both Kien Khleang and Prey Veng are difficult to access by various means of transportation or on foot. Transportation expenses are provided to those requiring assistance. Assistance is not provided for those that come on their own from outside the Kien Khleang catchment area. The centers are completely accessible for wheelchairs.

Dormitory and food service are provided. The dormitory can accommodate 50 males and 50 females. The facilities were built with a \$20,000 grant from a Canadian NGO, Grapes for Humanity. The facilities are clean and neat. One room has an extra door that is locked and cannot be opened from the inside in case of an emergency. The room has only one exit at this time, and the door should be usable in case of emergency. Meals are provided three times daily with an extra serving provided to the children at mid-morning. Food is supplied through the World Food Program. The rice was labeled from USAID. The kitchen area was clean and neat.

### ***Referral Systems***

Patients mostly come for treatment after word of mouth referral, either from previous patients or during community follow-up. Kien Khleang is also the primary referral source of the other VI sites. Other referral sources that refer patients to Kien Khleang include the CIOMAL Leprosy Center, Rose Charities, Center of Hope (Sinhouk Hospital), and Kantha Bopha Pediatric Hospital.

Prosthetic and orthotic services are provided with little or no medical/physician oversight. No physician prescriptions are given for any of the services provided. Physiotherapists and the four prosthetists/orthotists determine patients' needs, and if they recognize problems, they refer patients to Rose or Hope for management. Generally physiotherapists and prosthetists/orthotists are functioning as

primary health care providers and need to screen for medical causes of disability and complications and determine if physician evaluation for other medical or surgical options is necessary. The rehabilitation coordinator does consult with the physios and prosthetics/orthotics professionals (at all sites) and helps determine alternatives for these referrals. An orthopedic surgeon from Hope International does run a monthly clinic, but daily services are not provided. If patients require other medical or surgical services, they are transported to the referral facility (usually Hope or Kanta Bopha), and a rehab worker (social worker) attends the clinic to communicate the results of the consultation.

### ***Patient Assessment and Evaluation***

All patients are assessed simultaneously by a physiotherapist and a prosthetist for the treatment plan. Prosthetics/orthotics orders are written out, but if a different prosthetics/orthotics practitioner is assigned the patient, a new assessment is done to confer the plan. This process was inefficient and has already been corrected. The physiotherapy assessment does list problem areas at the beginning of the chart, but these are not always used to determine treatment goals and prognosis, and re-evaluation is not documented consistently or appropriately.

### ***Prosthetic and Orthotic Services***

#### **Staff**

Prosthetic/Orthotic staff includes four ISPO Cat. II (orthopedic technologist), 12 technicians, and six bench workers. At some point, VI/C referred to their orthopedic technologists as certified prosthetist/orthotist (CPO). This is an inaccurate designation of their training and qualifications (A CPO is the equivalent to a Cat. I professional, and none of the Khmer staff has attained that level). The only Cat. I professionals (CPOs) in Cambodia are expatriate staff working for

NGOs. This misdesignation only becomes a problem when VI/C reports staffing levels, requests are made for additional CPOs, or a member of Khmer staff applies for a CPO position.

### **Prosthetic Services**

Prosthetic service includes primary fittings, replacement and repair of all levels of amputation, but primarily transtibial and transfemoral levels. ICRC technology is utilized. VI/C manufactures their own feet, which are available in various sizes and include a Symes design unavailable from ICRC. They also manufacture for their own use an ankle rotation and motion component. Transtibial prosthetic socket designs are primarily of the PTB design without distal contact and with a liner. Check sockets were not utilized. Standard foot socks were substituted for prosthetic stump socks. The quality of prosthetic fit appeared good, but the lack of use of prosthetic stump socks is of concern. None of the several transtibial amputees examined had excessive pressures on their limbs. Patients ambulated well with minimal gait deviations. Stump socks will improve fit and accommodate stump volume changes. The use of stump socks may also reduce the frequency of refabrication of a new prosthesis. Currently patients are reporting about two years use before replacement because of fit or breakage. Breakage appears to be related to the weld on the cosmetic cover coming loose. This does not affect function but could be addressed through better welding technique. Transfemoral prosthetic design is of the ICRC design. Socket fit and alignment appeared appropriate.

Some upper extremity prosthetic services are provided. ICRC components are utilized. VI/C has designed a lightweight, foam-covered cosmetic hand made with electrical wire in the digits. This is a good passive hand with good cosmesis that is interchangeable with standard metal terminal devices. The long-term durability of this hand is uncertain,

but its weight and cosmesis make it attractive for use in this environment

Overall, the prosthetic services at Kien Khleang are good. VI/C Kien Khleang projects that they will provide 840 prostheses per year for this extension.

### **Orthotic Services**

Orthotic services utilize polypropylene materials and ICRC metal components. There is little variation in lower extremity orthotic design. Knee Ankle Foot Orthotic (KAFO) designs generally include a drop lock knee and solid ankle. Ankle Foot Orthotic (AFO) designs are primarily solid ankle design with the exception of two articulated ankles that use ICRC's Oklahoma design, which was used in the treatment of two patients with clubfoot. The use of articulated designs for patients with neurologic disorders is clearly outside the staff's training and comprehension. The majority of orthotic patients treated at the Kien Khleang Center could have benefited from some degree of ankle motion and/or dorsiflexion assist. The lower extremity orthotic services provided by the Kien Khleang Center are of good quality but could be greatly enhanced with variations in orthotic design. All the lower extremity orthoses evaluated were fitting, aligned, and manufactured properly. Training and proper mentoring will address the required design changes.

Spinal orthotics are provided on a limited basis and until more medical services are available, this service should be limited to emergencies only. Staff has had little training in scoliosis management or x-ray interpretation and are not equipped technically or professionally to properly manage spinal deformity. Currently these patients are sent to CSPO for management.

The center has a very effective clubfoot treatment program of taping and casting. However, patients who are ambulatory are permitted full weight bearing too soon after

casting, and the plaster is breaking down. Weight bearing should not be permitted for 24 hours after application. Some consideration could be given to reinforcement with fiberglass casting tape.

The storeroom is secure and well organized. The Center maintains an inventory of materials for one year of operation.

The orthotic services seen at Kien Khleang are good, within the design selection used. A total of 1,248 orthotic devices are projected to be supplied each year of this grant extension.

### **Training/Professional Development**

The four senior P&O staff members would like more training in all areas of P&O, but they also would like the opportunity to specialize. All appeared eager to learn, confident, expressive, and professional. They did not understand the situation with the two Australian P&O volunteers currently with VI/C. Staff members believed that they provided more information to the volunteers than they themselves received. This is understandable in that both groups probably had the same basic technical training, but the Khmer P&O had longer clinical experience. This scenario should be avoided in the future.

### **Wheelchair Production**

Wheelchair production is performed by 12 technicians, many of whom are disabled with amputations or varying degrees of visual deficits. VI/C produces wheelchairs for both adults and children. Chairs can be customized based on individual needs. This department also provides a variety of walking aids and/or frames. The department is well designed and equipped. If production numbers were to be increased, additional automated machinery should be considered, as long as the automation does not displace the jobs held by the disabled employees. This department is supervised by a creative Khmer and appears able to be a stand-alone department or unit. Two other wheelchair production facilities produce a design unlike that produced by

VI/C. The Jesuit Order produces a wooden chair, and a Japanese NGO produces a folding design on the same compound as Kien Khleang. The VI/C design is a rugged design, well suited for Cambodia. There is no duplication of effort among the three designs. There is no indication that the other two groups provide custom designs. Wheelchair production is projected to be 420 chairs produced each year of the extension.

### **Foot Production**

Foot production is carried out by a Khmer staff of four. An adequate variety of foot sizes, both adult and child, is produced. VI/C manufactures a Symes foot, which is needed for that level of amputation. This production process is labor intensive. Nearly five hours is required to produce a pair of feet. The staff use a detailed procedure of building up the rubber in an organized and standardized method. The VI/C foot design does not appear to perform any better than the ICRC design, but performance and durability are being studied by ISPO. ICRC does not produce a Symes design. The dynamic ankle unit produced in the foot department is a needed item in prosthetic service delivery, and an equivalent product is not produced by ICRC. Feet have been sent to Sierra Leone and Angola to support VI efforts in those countries. Foot production is projected to be 1,248 each year of the grant extension.

### ***Physiotherapy Services***

#### **Status of Services in Cambodia**

Physiotherapy services have been provided by both expatriate and local physical therapists/physiotherapists since 1987 when Handicap International (HI) Belgium started the physiotherapy training program. In 1996, five expatriate physiotherapists worked in NGOs in Cambodia, and in 2001, three physiotherapists worked in NGOs. Prior to 2000, 139 physiotherapists had graduated from the physiotherapy training program, with approximately 13 students graduating

per year. At present, the main employer is the MOH in the hospital settings and NGOs in rehabilitation settings. Physiotherapists are also seeing patients in their homes privately.

### **Space Available**

Space is crowded at Kien Khleang as well as at Kratie. No facility has room to expand the physical therapy services in the currently allocated space. An additional area at Kien Khleang is available for sports activities. The areas in front of the Khmer house are also used for gait training when not flooded. The eating area could also be used as a rehab or teaching area when the children are not receiving therapy. Activities of daily living could be practiced during the educational sessions. An area for quieter treatment would also be preferable for the treatment of cerebral palsy patients and other clients with neurological disorders. (The Khmer house is apparently used for this function.) The area used for cerebral palsy treatment at both Kien Khleang and Prey Veng has mirrors that are suitable for pediatric disorders, but mirrors for gait and exercise therapy would be ideal.

### **Equipment Available**

Present equipment is adequate for treatment needs. Some possible additions would strengthen the exercise components of the treatment programs. Kien Khleang would benefit from a stationary exercise bike, additional cuff and dumbbell weights, wall pulley systems, and gym balls. The functional gait training areas with simulations of sand, rocks, slopes, ladders, rope bridges, walkways, curbs, and logs are state-of-the-art for developing countries and are well designed. These areas allow patients to practice and improve skills in the Center prior to having to deal with the difficult terrain outside that often challenges those with disabilities. The Khmer house at Kien Khleang is innovative and provides an exceptionally useful addition to the Rehabilitation Center, limited at the moment by flooding in the area. This has significant potential to provide functional rehabilitation.

## ***Standards of Care***

### **Patient Assessment**

Patient assessment skills and documentation of the physiotherapists observed are thorough in the areas of history, muscle testing, subjective complaints, and alignment.

A standardized evaluation form is used at all sites with documentation in English and Khmer. A valuable addition to the chart is a photograph taken on initial evaluation and retaken with any major changes in status. The quality of more advanced assessment techniques such as ligamentous stability testing, joint mobility testing, and differential neurological assessment was not of the standard necessary when patients have not seen a physician. In addition, adaptation of assessment techniques for complex or multiple problems may be an issue.

### **Evaluation**

Among the physiotherapists the evaluation team observed, basic assessment skills were thorough, and the techniques were carried out well. However, interpretation of the meaning of tests within the context of relevant pathology was limited. The interpretation of assessment findings is essential to develop timeframes for treatment, treatment planning, and determination of a prognosis. This lack of interpretation skills can be attributed partially to the amount of clinical experience post graduation. However, early graduates of the physiotherapy training program were noted to have little clinical teaching during their training and exposure to the complex rehab pathologies (polio, cerebral palsy, and paraplegia) only after graduation. The physiotherapy program covered skills regarded as the base-level techniques without the development of more complex thought processing and clinical decision-making skills. This area of need has been identified by multiple sources, namely, the VI is rehabilitation coordinator, professional staff from other NGO's, and the DAC subcommittee<sup>3</sup>. Recent graduates of the

physiotherapy program were noted to demonstrate a higher standard of skills. In particular, the determining primary problems and contributing causes, diagnosing problems particularly in the neurological areas), establishing goals, monitoring changes and adapting treatment plans, establishing timeframes and altering management to expedite recovery of function, and planning for the long term were all areas that could be improved.

**Treatment Delivery**

Patient management skills were observed in the following areas:

**Table 1. Patient Management Skills**

Condition	Treatment
Clubfoot	soft tissue mobilization (massage) stretching casting family education
Paraplegia	exercise therapy, gait training
Amputees	exercise therapy, gait training, stump management, stimulation
TB joint	exercise therapy
Cerebral palsy	passive range, neuromuscular stimulation, neuromotor re-education techniques
Back pain	Transcutaneous Electrical Nerve Stimulation (TENS), passive range of motion, education of family
Polio	gait training, post contracture release casting, stretching, wheelchair and orthotic consultations, massage
Post surgical fixation (delayed union fracture)	exercise therapy, passive range of motion, massage

Other common pathologies treated but not observed include arthrogryposis, ankylosing spondylitis, other forms of arthritis, burns, and traumatic and brain injury.

Physiotherapy treatment skills were adequately and effectively delivered in most of the therapist-focused techniques. Progression of exercise techniques and of the

skill level of neuromuscular re-education techniques could be improved. Gait training was mostly delivered by the rehab workers and overall was good. This is an area that might benefit from more detailed problem-solving and understanding of the underlying biomechanical forces involved with pathology, with involvement of the therapists in this aspect of the gait training. However, in

comparison to similar situations in other developing countries or even in some areas of developed countries, the standards were high, and all patients were actively involved in their rehabilitation. Another very positive aspect, evident by patient and family demonstration, was the emphasis on patient and family education and involvement both early in the rehabilitation timeframe and later after discharge. In the presence of such a high rate of HIV, additional hand washing facilities and availability of gloves for the management of patients with open wounds are necessary.

### **Outcomes**

Extremely good outcomes were noted for patients with disabilities due to clubfoot, polio, incomplete spinal cord injury and amputations. These outcomes were noted by observations of patients during community follow-up, patients receiving follow-up services with orthotic or prosthetic adjustments, patient progression by documentation and photographs, patient and family reports, and evaluator assessment of function and impairments.

## ***Training***

### **Continuing Education**

Continuing education courses have been organized in conjunction with other NGOs to address gaps in the new graduates' knowledge and skills. Some of the previous topics include gait training, pain management, and neurological patient treatment. Claudie Ung has organized these courses with other therapists from Red Cross and Handicap International. The Physiotherapy Subcommittee of the Disability Action Council is also addressing areas that have been noted to be inadequate in the basic training or areas where additional training is needed. The PT school's aim is to produce graduates with a wide spectrum of basic skills and knowledge, necessitating specialized and detailed continuing education at a later stage (see section on physiotherapy program).

Physiotherapists have been selected to attend courses in the same topic area in order to maximize learning transfer and benefit.

### **Mentoring/In-House Training**

Claudie Ung works individually with therapists and in groups to address patient issues at Kien Khleang and the other sites. Since she was appointed to the position of rehabilitation coordinator six months ago, she has taken on more significantly administrative responsibilities and her overall workload is excessive. The supervisor at Kien Khleang is a rehab worker who was trained on the border and speaks English well. Although he is obviously able to manage and coordinate the logistical functions of the physical therapy department, he is unable to provide the professional mentoring needed for new graduates, students, or established physical therapists who are reaching a point at which additional options for treatment delivery are needed. The therapists at Kien Khleang graduated from the early classes in the Cambodian Physiotherapy program when the curriculum focused on hospital-based treatment, and their exposure and training in the specific needs of the patient population seen at a rehab center took place through in-house training organized by Claudie. Five of the therapists at Kien Khleang were in the same class, which complicates the development of leaders and experience to be passed on to the next generation. In addition, the patient population is extremely complex, and patients have not always been assessed by a physician. Such an assessment requires adept evaluation and medical screening skills.

### **Rehab Workers**

Rehab workers are also employed at Kien Khleang, Prey Veng, and in the CFU programs. The rehab workers either obtained training during the war in the camps on the Thai border or were trained at Kien Khleang in conjunction with Handicap International. Two of the rehab workers are disabled themselves. The rehab workers are classified into two categories based on an examination

process (Rehab Worker I and II). The workers who trained on the border had already been functioning as assistants for two to three years prior to being employed at Kien Khleang. The training program consisted of seven months of lectures and hands-on practical training followed by a written and practical exam. The Rehab Worker I is considered to be competent enough to work with patients without supervision while the Rehab Worker II requires supervision. The evaluation team observed the rehab workers performing treatment techniques and some specialized skills such as gait training and sports and activity direction. The workers are appropriately supervised and play an important part in the overall function of the facilities.

### **Motivation/Reward System**

The staff's salaries and benefits are better than those of the government sector. Salaries and benefits are standardized across the NGOs to avoid a competitive market situation. It is always possible that professionals will be recruited for other types of jobs, but salaries are competitive in comparison to non-technical job positions. Benefits include sick leave, health insurance, a 13th-month annual bonus, annual leave, in-house training, and support for continuing education as available. Participatory involvement, job stability, and the opportunity to contribute to assisting the Khmer people are also cited as being motivating factors. All physiotherapists interviewed were satisfied with their positions and job situation. Positions with the NGOs are valued especially since government hospital positions have been frozen for the past two years. Hospital salaries start at +/- \$20 per month.

### **Community Follow-Up**

Community Follow-Up (CFU) services provide follow-up for all patients receiving services at Kien Khleang. Teams go out daily

and contacts patients based on a schedule established at the time of treatment. Six to eight patients are scheduled daily by a team including a physiotherapist and a rehab worker. The evaluation team went out with the two normal CFU workers and their supervisor was able to see five patients in about five hours. The distance between each location is considerable. The team saw two polio patients, one paraplegic whose condition resulted from a tree falling on her, one transtibial amputee whose condition was due to a logging injury, and one clubfoot deformity. Two of the patients could have had improved function by the addition of articulated ankle joints. One of the patients had received four KAFOs in the past four years and was to return to the Center for a fifth to accommodate his increased height, when all that was really necessary was a one-hour modification to his existing KAFO. The clubfoot patient had received three pairs of orthoses in the past two years. The bottoms of the orthoses were wearing out because the soling added to the plantar surface was not sufficient. Overall quality of the orthoses assessed was good, as was fit and fabrication.

There are critical deficiencies in the community follow-up program. Insufficient information regarding the patient's status, goals, expected outcomes, and purpose of the follow-up is documented in the chart. The members of the community follow-up team are unable to identify design changes or modifications that might be better used. They are also unable to identify additional rehabilitation problems or needs that may arise with time or complications. In addition, the exercise programs were not documented to allow follow-up, the CFUs (including the physios) were unable to progress home exercise programs adequately and the home environment was not used to provide functional rehabilitation or re-education. These problems are not due to a lack of motivation or processing issues, but rather to lack of knowledge about pathology, prognosis, exercise techniques, functional re-

education techniques, and higher-level problem-solving skills. The major goal of the CFU visit seems to be identifying whether the devices provided are still functioning adequately, and when a problem is identified, the CFUs refer the patient back to the center for repair or replacement. Some activity was noted related to social issues, and at Kien Khleang it is not clear as to where the financial resources for these activities are obtained. (Provision of a mule for an amputee specifically observed.) The standards of the technical delivery of rehab services were also not being evaluated in the true sense, as information was not being absorbed, assimilated, and interpreted with respect to either P&O or physiotherapy services and communicated back to the rehab team. The patients seen in the Kien Khleang follow-up areas were not in extremely remote rural areas, and at least two of the patients seen could have obtained transportation to Kien Khleang for follow-up. The question of whether they would return for follow-up or changes to their devices is an issue that may not warrant the expense of making a trip with two staff members.

### ***Management and Administration***

The Kien Khleang Center is managed directly by Khmer staff. VI/C country staff members oversee all country projects. Expatriate supervision is limited to Larrie Warren, country director, Josefina McAndrew, associate director for Administration, and Claudie Ung, rehab coordinator. Both the national staff and the Expatriate staff are involved in budgeting, planning, reporting, and operational goals of all four centers. The Kien Khleang Center is well organized and the staff members work together to operate and manage the facility.

Patient records are maintained in an orderly manner. Electronic data is collected and a database used by VI/C. This database is not

compatible with other data collection programs from other NGOs in Cambodia.

### **Prey Veng Physical Rehabilitation Center**

The Prey Veng Physical Rehabilitation Center opened in 1995 to bring services to the southeastern region of Cambodia. The city of Prey Veng is located some 50 km east of Phnom Penh in the province of the same name. Some of the roads are impassable after the annual rains when the Mekong River floods. A part of the team's trip required a 30+ minute open boat ride.

The Prey Veng Center also serves the Svay Rieng and Kompong Cham areas that are extremely poor rural areas with poor soil and little other economic income. The total catchment area has a population of more than 2 million. The following table illustrates the numbers and types of patients the center has served from 1995–2001:

**Table 2. Breakdown of Patients Served by the Prey Veng Center**

<b>Type of Patient</b>	<b>Number</b>
Amputees	735
Polio	439
Clubfeet	164
Cerebral palsy	329
Other (tuberculosis, arthritis, fractures, hemiplegia, congenital anomalies, nutritional deficits)	1,207

The number of amputees is decreasing, and most of the new amputee population now results from traffic accidents or domestic accidents rather than from land mines or UXOs. This area of Cambodia was not heavily mined during the war, but it is one of the most economically disadvantaged.

***Staff***

The Center has 11 technical staff, 7 support staff, and 3 administrative staff members. Positions include 2 orthopedic technologists, 2 P&O technicians, 1 P&O bench worker, 2 physiotherapists, 2 rehab workers, 1 SPC supervisor, and 1 screener. One Australian Volunteers International (AVI) expatriate prosthetist/orthotist is currently on staff (Sarah Cock) as well. Sarah had two years experience after P&O school before volunteering. She has been with the Center for 18 months and will be completing her two-year contract. Sarah provides academic input as requested and not fabrication methods. The workshop supervisor has given her routine working assignments, the same as other staff members. She does not interfere or provide input in P&O management methods provided by national staff unless asked or directed to do so.

***Facility***

The Prey Veng Center is built outside Prey Veng on land provided by MOSALVY. The Center is located in an L-shaped building,

which is well organized, maintained, and clean. The P&O section is well laid out. The machine room is closed off from the other spaces for safer, quieter operation. The ovens are mounted on an outside wall to reduce the heating effect in the room. The equipment appeared well maintained and operational. The space and the equipment appear adequate for the current and projected workloads. The storeroom is secure and orderly. Inventory is maintained for one year's production needs.

***Prosthetic and Orthotic Services***

The Center provides a full range of P&O services using polypropylene and the ICRC technology. The quality of workmanship, fit, and design selection was equal to that seen at Kien Khleang. The quality of prosthetic/orthotic services is good overall, but upgrade training and mentoring are needed to include a wider range of more functional designs. A total of 180 prostheses and 480 orthoses are projected to be provided each year of the grant extension. The Center has provided services to 1,356 patients since it opened. This number appears small in comparison to the 2 million population of the area. No proper needs assessment has been undertaken to date, but plans are in the works for the DAC to do so. The number of patients served could be increased without taxing staffing needs if orthoses and prostheses were repaired or adjusted rather than always replaced. This change in operation will require some sophisticated decision making.

One patient in the physio area was wearing a molded plastic Lumbosacral Orthosis (LSO). The patient was receiving gait training because of lower extremity weakness. The patient had sustained a spine fracture (L-3 Burst) five months ago. He had been receiving treatment intermittently in the Center for all but the first two weeks since injury. His chart called for a TLSO, but an LSO had been provided. The LSO only extended to the fracture and was not providing proper support or protection. The orthosis is probably not needed any longer because of the length of time since the fracture. The problem is that the wrong design was used, which may have caused greater paralysis of the lower extremities. There is no apparent physician involvement and even though AP/LAT X-rays were available, it is not clear whether anyone could interpret them. The fracture was obvious, but the degree of kyphosis had not been measured and progression had not been determined. This was not Sarah's patient, and she had not provided any technical or professional leadership. Qualified expatriate staff would be expected to do so. Critical errors in patient management must be addressed by whomever has the capacity to do so.

Wheelchair services are provided using chairs obtained from Kien Khleang. Custom chairs will be provided as needed.

### ***Physiotherapy Services***

Of the two physiotherapists at Prey Veng, one graduated two years ago and one four years ago. The same observations were noted as at Kien Khleang with respect to prognostic and differential diagnosis skills, and progression of exercise therapy was noted as needing improvement. However, the standards of physiotherapy services at this facility were good for the level and stage of the staff and the isolated environment. Another area that needs to be improved at all sites is the use of functional rehabilitation techniques—movement re-education and ADL training.

The treatment of clubfoot is good at all facilities, and good outcomes are being obtained with conservative management. Another positive aspect of the Prey Veng services is an obvious delineation in the areas of specialization between therapists. The supervisor also noted that staff are proactive and participatory. They do not wait for instructions, but initiate projects and design different methods of reaching a goal. These are positive traits for developing leadership and technical sustainability. An expatriate physiotherapist was on-site who provided mentoring and training when the site was opened.

The facilities at Prey Veng have slightly more space than those at Kien Khleang for physio treatment, but there is still no room for expansion. Prey Veng has an exercise bike that is functioning but does not provide sufficient resistance.

### ***Community Follow-Up***

Community Follow-up is an ongoing activity at the Center. The methodology used is similar to that used at Kien Khleang. The distances traveled to get to patients are far greater in this area than in Kien Khleang, and the roads are extremely poor. There are two teams at Prey Veng (one rehab worker and one physical therapist/orthotist) and four members of MOSALVY who assist the teams. The MOSALVY members received one week of theoretical training and are still undergoing on-the-job training with the CFU teams. The MOSALVY members receive \$2 per diem per day and \$20 per month. They are used approximately two days per month and can be released from other duties anytime the CFU teams need their assistance. The assessment team saw four patients during CFU: Polio, clubfoot, congenital amputation, and cerebral palsy patients. The outcome of these visits was not dramatically different than that seen at Kien Khleang. The quality of design selection was appropriate for the cases.

Some social issues are worth illustrating with regard to these people. The eight-year-old polio patient is an only child because the mother was afraid that any other children might also have the same conditions. She did not know about polio immunization. The congenital amputee had just a foot coming out straight anteriorly at the left hip. This was not a standard proximal focal deficiency (PFD). Agent Orange was mentioned as a possible source for this condition. The prosthetic solutions were innovative and functional. The case of the child with cerebral palsy was probably the most difficult. This very happy, very pretty six- to eight-year-old girl walks in a special bamboo hut, equipped with eight-foot-long bamboo parallel bars that have become polished from her hands sliding over them. She wears well-made, properly fitting KAFOs. She walks back and forth between the bars every day. When she gets tired, she sits on a bamboo bar at one end. She does very well in her orthosis. With an adapted standing frame, crutches, or a walker she could get out of the hut and explore her yard. The CFU does not have the training to recognize the potential for this child. The need for creative thinking and an emphasis on finding alternatives may be beyond the scope of the CFU workers who receive limited formal training and on-the-job training, but the rehabilitation professionals should have recognized and produced the necessary adaptive equipment.

### ***Education and Small-Income Grants***

One program at Prey Veng that was highlighted by staff (present at Kien Khleang as well) is the provision of assistance for education and microgrants for income development. This project is funded by UNICEF. The purpose of the education project is to provide school materials or transportation for children with disabilities. Often children do not attend school if they are disabled because of accessibility issues or logistical difficulties. The team provides

education on educational possibilities and provides children with writing materials, clothes, school bags, books, and transportation if necessary (bicycle, tricycle, wheelchair, or bicycle for sibling). They also communicate with the teachers to facilitate the child's attendance, e.g., bringing a bike into the school or building a ramp. The team does perform a screen for economic need and budgets for 30 individuals per year. At Kien Khleang, each applicant receives the same amount. The CFU workers check the schooling situation.

The small-income grants are used to buy materials or land to initiate income generation activities. Funds have been used to buy land, bicycles, cows, barber scissors, sewing machines, workshop materials, and fishing nets. The recipients of these services are now contributing to society and taking care of their families.

### ***Management and Administration***

Management and administrative functions are handled by Khmer staff, with input as needed from VI/C offices in Phnom Penh. The Center appears to be properly managed and following guidelines established for operation. Patient records are properly maintained. Hard copy as well as electronic files are maintained. The Center does provide electronic data input to the data bank maintained by VI/C in Phnom Penh. Center staff communicate with Kien Khleang by telephone and e-mail. This is one center that has instituted a waiting list with some success. However, patients are staying in the Center and being supported while they wait for treatment.

### ***Referral Systems***

Prey Veng and Kratie are at a significantly greater disadvantage due to distances to

referral centers. The referral centers include the following:

**Table 3. Referral Centers**

<b>Center</b>	<b>Service</b>
Kantha Bopha (Swiss NGO)	Free services for children, tuberculosis, surgery for deformities, diagnostic testing
Kien Khleang	Complex rehabilitation
Association of Medical Doctors of Asia (AMDA)	General medicine, typhoid, dermatology, headaches
Hope Hospital	Diagnostic testing, tuberculosis, AIDS, fracture management
Takmoa-Canitas	Cerebral palsy, mental health
Transcultural Psycho-social Organization (TPO) (Soviet)	Adult mental health
GS (Jesuit)	Vocational training
AARCC (Japanese)	Vocational training
United Cambodia Community (UCC)	Vocational training
National Center for Disabled People (NCDP)	Database for employment possibilities
Caritas	Visual deficits
Lavalla School	Intensive school upgrading
Battambang	Paraplegia or tetraplegia, especially if bowel and bladder program cannot be stabilized
Other NGOs or local hospitals if from other provinces	

### **Kratie Physical Rehabilitation Center**

The current Kratie Center was opened in August 2000. It provides services to the northeastern region of the country. Kratie is approximately 100 miles northeast of Phnom Penh on the Mekong River. It is primarily accessible by riverboat from Phnom Penh. The trip takes about five hours. The area can be flooded during the rainy season.

#### **Staff**

The Center has a national staff of 10 and one AVI staff member. The prosthetics/orthotics section has one Khmer prosthetist/orthotist

and the AVI volunteer (Jim Lavanos). The Khmer P&O (Nom Channa) is a recent graduate of the CSPO School. Jim had one year of experience out of the Australian P&O school on his arrival. Staff members also include one prosthetics/orthotics technician, one prosthetics/orthotics bench worker, and two Khmer physiotherapists. The site manager and four employees (three security guards and a housekeeper) are listed under administration.

#### **Facilities**

The facilities are small but appear adequate for the services currently planned. The

physical therapy area is small and crowded, as were all the physical therapy areas at the three sites visited. Services are spread over three buildings. The main building occupies the prosthetics/orthotics and physio areas. Administration is located in a separate building, and the dormitory is in a third. The dormitory holds 32 people. Food is not provided at the Center, and there is no cooking area at this facility. Patients are provided money so that they can purchase food locally.

The workshop area is clean, neat, and well laid out. Machinery is well spaced, and everything looks well maintained and operational. Separate assessment and casting rooms are available and are well maintained and private.

### ***Prosthetic and Orthotic Services***

Prosthetic/orthotic services were not quite on a par with those seen at Kien Khleang and Prey Veng. They were acceptable, but fabrication seemed slightly inferior to that in the other centers. There may be several reasons for this. Statistics show that prosthetics production is at 117 percent of projected and orthotics is at 146 percent of projected. There is only one technician and one bench worker to help the two prosthetists/orthotists. During trial fittings and gait training, the orthoses are taped on the patients using Scotch tape. The reason given is that the prosthetists/orthotists do not have time to sew straps. This is an unsafe practice and leads to the development of poor work habits and other improper shortcuts. Some of this behavior is also due to the professional immaturity of the prosthetics/orthotics staff. More bench help is needed, and more senior supervision is required. Workloads are only going to increase.

Treatment of clubfoot appears to be at a very good level. However, the staff had the same problems as those at Kien Khleang in that

casts were breaking when patients put weight on them too soon. Synthetic cast tape could rectify this problem. Donated prefabricated thermoplastic pediatric AFOs had been custom modified and were being used by a few patients at the Center.

Prosthetic and orthotic services are acceptable, but some issues need to be addressed. Prosthetics/orthotics services are projected to produce 144 prostheses per year and 120 orthoses per year. Orthotics production will probably exceed that projected number as the population learns of the services available.

### ***Physiotherapy Services***

The two physiotherapists are expected to manage a patient load of 30+ patients a day. That number would be manageable if both therapists were always present. However, one physiotherapist usually travels with the CFU team. This is hampering the effectiveness of the rehabilitation even if the families are assisting with patients. It is also potentially resulting in longer patient stays with increased cost for the Center and also loss of income/home support for the patients and families. One aspect that is a deterrent for patients returning to the centers for follow-up care was the prospect of long stays and the loss of income during the stay. An overall effort to decrease time spent at the centers might be considered. Physiotherapists are also expected to assist with administration tasks such as handing out money for lunches. This practice is a waste of professional resources. Space for physiotherapy treatment is too small, and there are too few treatment plinths for the present patient load. The therapists were keen and enthusiastic and showed evidence of both leadership potential and a willingness to learn.

Since this Center is a relatively new addition to the VI/C program, it has never had the benefit of an on-site physiotherapist. The

rehabilitation coordinator does visit to provide professional input and training. The same professional knowledge and decreased awareness of treatment options were noted as at the other sites. The therapists were also noted to be using more passive range of motion and massage (this could have been the particular patients present) techniques. One patient with extremely complex problems resulting from a traumatic brain injury and a history of falls needed to be worked up for epilepsy or other neurological diseases, and the therapists were struggling with whom to refer her to. The staff had spoken to Claudie about the patient, and blood tests were done at the hospital, but this case was an example of how complex the problems of some of the patients can be.

### ***Referral***

This Center is adjacent to a 150-bed hospital with surgical service available for a fee. Unlike the staff at the other two centers, VI/C Kratie staff members are somewhat reluctant to use those surgical services. Amputations done at the Center have a significant rate of complications, infection, poor stumps, etc. Tendon releases for polio are not done and are referred to Phnom Penh. The evaluation team saw one transfemoral amputee who had been surgically managed at the Center and had about four inches of exposed femur that scar tissues had granulated to the bone. This condition makes fitting a prosthesis very difficult. Only a very experienced surgeon should undertake the needed revision. The teams observed another child with a history of multiple open wounds and resulting contractures and avoidance of weight bearing. The child needed to be examined for the possibility of TB or other infections.

### ***Community Follow-Up***

The evaluation team went out with the CFU team for one half-day and drove 55 km to see

two patients. Both patients were diagnosed with polio. One of the two patients, a 15-year-old overweight girl, is wearing an improperly designed KAFO. There are psychosocial issues at stake here, and the young lady did not want to leave the home because of the fear that people would laugh at her due to her weight. The orthosis did not improve her functional level, and she preferred not to use the device.

The second patient is a severely involved 13-year-old boy who is a wheelchair user. The team visited him at his school. The CFU workers were primarily concerned about the condition of his wheelchair. This young man has one good extremity, his left arm, with minimal motor control of his right arm, primarily in the fingers. He can position this arm for support, but the humerus is completely posteriorly dislocated. Both legs are contracted and have no functional muscle control. Due to his spinal curvature, he must support seating by positioning his right arm beside his body, having the hand in contact with the seat. This forces his shoulder out of the socket by four inches. Bolsters should be added to his chair to support his spine and to help him sit. Adaptations to his school seat should also be made. The CFU team has no training in this area and has no idea of the options available. None of the members of the CFU team evaluated the school environment or the boy's ability to transfer, use his wheelchair, function within the classroom, or perform other activities of daily living. The teacher was asked about his performance at school, but was asked no other functional integration questions. There was no attempt to address the environmental barriers for wheelchair mobility, perhaps because the child was pushed around by his friend. He was able to maneuver his wheelchair with one hand and could have been functioning more independently with some encouragement from the teachers and a few simple environmental adaptations.

Schools seem the ideal places for multiple patients to be identified, for problems to be addressed, and for real differences to be made in function. However, such changes require a more creative and evaluative outlook than is presently being used. It is also a prime opportunity for patient advocacy and community education for the teachers and other students.

Two of the MOSALVY representatives attended this CFU visit. It is not clear what benefits are derived from involving the MOSALVY staff, as there have been problems identifying the correct individuals for training. The MOSALVY representatives mostly deal with orphans and vocational training in their normal daily activities. The responsibilities of the physical rehabilitation branch of MOSALVY are unclear. On the CFU, these members check on the state of devices and refer back to the Center if the patients have specific requests.

The CFU efforts are not realistic for Kratie Center at this time due to the limited availability of the staff. Eleven days per month, one physio and one prosthetist/orthotist are required to go out of the Center for CFU, leaving only one practitioner in each department to manage the day's in-patient workload.

### ***Management and Administration***

Transportation allowances are provided for patients who require them. Medical and surgical services are not free in Kratie, so VI/C pays the necessary fees when required. Management and Administration is under the directorship of the site manager, and established procedures are followed as directed from the VI/C country director. Patient records and data management are standardized, appear on a par with the other centers, and follow established guidelines.

## **Other Centers Visited**

### ***Rose Charities***

The evaluation team visited Rose Charities, which is located on the same compound as Kien Khleang, and talked with Dr. Jim Gollogly, the head of delegation. Rose primarily provides a free surgical service. Its early work was related to the surgical preparation of the eye socket for a prosthetic eye following land mine injuries. It later moved to repair of cleft lip. Dr. Gollogly's background is in orthopedics, and he also addresses clubfoot deformity and tendon release for polio patients who are referred to his clinic by VI/C. If Rose is first to see a patient in need of rehab services, staff members refer the person to Kien Khleang.

### ***Order of Malta Leprosy Treatment Center***

This facility is also located on the same compound as Kien Khleang and across a parking lot from Rose. Rose Charities and the Order of Malta do not interact. Its primary mission is the medical/surgical management of Hanson disease (leprosy) patients. Full services are available, including amputation. Patients are referred to Kien Khleang for special sandals and a wire spring dorsiflexion assist orthosis. The team did not see any total contact adaptations made to the sandals, the staff indicated that they are not provided. The use of total contact inserts to protect the insensitive foot is common practice and still advocated by those treating Hanson disease or diabetic neuropathy in other parts of the world.

### ***International Committee of the Red Cross***

The evaluation team visited the production facilities and Mr. Jean-François Gallay, head of Physical Rehabilitation Programs and a prosthetist/orthotist. ICRC runs a

comprehensive rehab program in Battambang, 140 miles northwest of Phnom Penh. This Center includes a spinal cord treatment program. It is staffed by three expatriate prosthetists/orthotists and had an expatriate physical therapist from 1991–1997. It has a Khmer staff of more than 50 people. The Center has the capacity to perform 200 fittings per month. The majority of the patients are land mine victims and amputees. The orthotic workload is restricted due to a lack of medical/surgical support. Components are produced at this Center and will continue to be produced. The Center provides components to all centers in Cambodia that provide prosthetics/orthotics services.

The Physical Rehabilitation Committee of the DAC, chaired by Mr. Galloway, has produced a report of a comparative study of rehabilitation services in Cambodia<sup>3</sup>.

### ***Cambodia School for Prosthetics and Orthotics***

The team visited Mr. William (Bill) Velicky, the outgoing principal of the Cambodia School for Prosthetics and Orthotics. His successor, Mary Scott, has a great deal of experience in the non-industrial world. She is a graduate of the P&O program at the University of Strathclyde in Glasgow, Scotland. The school at first took in only Cambodian students (estimated 60 prosthetists/orthotists needed), but the needs of the country are starting to be met, and the Khmer intake has been reduced. The newest class will have only three slots for Khmer, five for Laos, three for Sri Lanka, and four for Myanmar. The current graduating class will have external examiners from ISPO, and if successful, it will receive Cat. II recognition.

### ***Technical School for Medical Care, Physiotherapy Department***

#### **Physiotherapist Professional Training**

Professional training consists of three years of formal training at the diploma level based at the Technical School for Medical Care (TSMC). This program was started by Handicap International (Belgium) in 1987, with an agreement with the Ministry of Health. The program received national recognition in 1999, and the diploma is regarded as being equivalent to a nursing diploma or the prosthetist/orthotist diploma (Physical Rehabilitation report June 2001). Handicap International is withdrawing its financial support at the end of this year. In an October 2, 2001 meeting, MOH and MOSALVY representatives, NGOs, and other members of the Disability Action Council recommended that the physical therapist training be continued with an appointed board contributing to management of the school. The school is also requesting financial assistance from the NGOs.

Physiotherapists are admitted to the school by selection after passing the O level, which is equivalent to a high school leaving certificate (10 years of high school education). General education levels are reportedly roughly three years behind those in the United States. The first two years of training are primarily theory with some clinical rotations, and the final year consists of a larger portion of time spent in clinical internships.

There are six part-time instructors, all of whom have other clinical responsibilities with MOH/MOSALVY and/or private practice. The instructors also function as clinical supervisors, and other clinicians function as clinical supervisors. All the instructors graduated from the Cambodian training course. Some external instructors in specialist areas such as the spinal cord unit were taught by a physiotherapist who works in Battambang. During the first three years of the program, all the instructors were HI-

sponsored expatriates. In 1989, some of the Khmer students were selected to become instructors in the program. The qualifications of the instructors are therefore somewhat "ingrown," with the base of their knowledge coming from the same curriculum with limited opportunities for further development, diversification of experience and ideas, or access to educational resources. The present departmental coordinator was a medical doctor prior to training as a physiotherapist, and two instructors have completed the year and a half program in health education instruction. Other instructors have completed courses in Japan, local courses organized by VI, Red Cross, and Rose Charities (gait training, pain management, and cerebral palsy).

The curriculum was initially hospital-focused, but in the past two years, pathologies and treatment techniques used in rehabilitation centers have been included in the curriculum. Graduates indicated a strong theory component and insufficient clinical experience during their training. In the first year, the clinical component consists of a two-week period focusing on patient assessment. The second year includes three 12-week rotations in each of three areas: neurology, respiratory issues and trauma in hospital settings. The final year includes time spent in rheumatology, community-based rehabilitation, public health environments, and spinal cord/rehab settings. Students are required to complete a checklist of identified competencies and a practical examination of a patient treatment proctored by instructors. Graduates reported that the program included less clinical supervision than was desirable due to the lack of professional rehabilitation professionals in the country when the school first started. Recent graduates report some improvement in this situation, however, some graduates commented on the intensity of the program because instructors were only involved part-time.

Instruction is in Khmer, using French medical terms. Since most of the students are not fluent in either French or English, the number and quality of available resource materials is limited.

One student was supported financially by VI for physiotherapy school training. The student had completed the physiotherapy assistant training on the border. Other students received a stipend during training in return for a one-year service contract.

### ***Handicap International/ Kampong Cham***

Kampong Cham is located approximately 50 km northeast of Phnom Penh on the Mekong River. This workshop is the only rehabilitation service in this heavily populated province of more than 1 million people and a disabled population of 1,160. It has a staff of 14, with 5 in the P&O section. One staff member is an orthopedic technologist who graduated from CSPO in 2000. Four staff members are technicians who were trained in a program once run by the American Friends Service Committee (AFSC). The team's visit to this workshop was a disappointment. It is not well equipped, and the physio area is quite small. What was most impressive was the lack of activity. No patients were in the therapy area, and only three patients were in the P&O area. Three casts were being modified. This work might have been for our benefit. No work was being done throughout the workspace, and equipment did not appear to have been used recently. The workshop did not seem to be functional. This facility appears to have an insufficient systems infrastructure and the personnel lack motivation. Such conditions negate the long-term effectiveness of any development project.

### ***Sihanouk Hospital, Center of Hope***

Hope Worldwide is a faith-based NGO that focuses on medical/surgical education and then service. The Center provides free medical care of a very high quality, dispensed with a triage system that focuses on the most severe and complex medical and surgical problems. VI/C refers patients for surgical and medical services, and access is facilitated when possible. The team met with Dr. Ricaredo De La Costa, Dr. Graham Gumley, and the public relations director, Suzanne Gumley. Both doctors are orthopedists by training with specialization in hands. This Center knows its mission and its capabilities. Staff members are very good at what they do and realize they could easily let themselves get overwhelmed with patients. They have strict guidelines that they use to triage patient intake. To some, they may appear heartless and too strict, but they are bringing free Western surgical education to a country and helping to restore the medical/surgical infrastructure so badly needed in Cambodia. Dr. De La Costa attends a monthly VI/C clinic and provides a quality surgical service. The team found it professionally rewarding to see the work they are doing. The Center has a strong education focus and is training surgical residents and general medicine residents, as well as laboratory technicians, pharmacists, and nurses. Orthopedics Overseas and Nursing Overseas have newly established sites at this facility. They are also involved in an outpatient AIDS center and send some medical assistants to the community on an intermittent basis.



# Conclusions

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## Technology

### *Orthotics*

All three projects the team visited use polypropylene technology and ICRC components. Fabrication techniques used are appropriate and of good quality. The staff of the true projects demonstrated attention to detail, and this standard would be acceptable in a Western environment. The quality of orthotic fit was quite good. Orthotic function could be improved with design changes and the addition of articulated and/or dynamic ankle joints. The metal knee joints and uprights are all of steel, and someday lighter materials should be introduced. The knee joints are much larger than what is commercially available, but there are manufacturing limitations because of ICRC's machining capabilities. Some orthotic designs were intended to be worn without shoes, and in the case of very small children, a thin sole was added. The amount of material added was insufficient, causing the orthosis to come in contact with the ground and sustain excessive wear. The same design was observed for use in an adult Hanson disease patient. A build-up had been added but not rockered. The treating P&O did not understand the concept of rockering a shoe or the plantar surface of the orthosis.

Spinal orthotics are supplied on a limited basis. That policy should be followed until more training is offered and proper

supervision is provided. The one spine trauma case that the team saw with the improper LSO orthotic design may benefit from bed rest. A physician should be involved with all spinal cases but this option is not available in Cambodia. Perhaps a clinic could be arranged through Hope International. When the treating professional does not have specialty training or when an adequate physician is not involved, there is too great a potential to cause harm, provide ineffective treatment, and/or waste resources.

Upper extremity orthotics was not available during the team's visit. There was discussion of getting some of the pre-made devices and adapting a design for their use with available materials.

### *Prosthetics*

Polypropylene ICRC designs are used. Alignment and quality of fit appear appropriate. Transtibial designs all have a liner. Stump socks are sparingly used. No commercial grade sockets were in evidence. Generally one layer of stockinet is used or a foot sock turned around so that the heel of the sock corresponds to the patella. Proper use of stump socks will make the socket more comfortable to the user and prolong the useful life of the socket. The volume of a stump changes throughout the day, and socks are the most convenient means to deal with such changes. AVI staff members were not highly

impressed with the alignment adjustability of the ICRC systems. Their practice was to not tighten the alignment screws too much during alignment so that they could tap the parts to make changes while the patient was wearing the device. All patients had acceptable gait patterns indicating that the range of adjustability was sufficient.

Upper extremity prosthetics are provided but on a limited basis. Cosmetic restoration seems to be the most requested. ICRC is making a terminal device for functional use. The team saw one upper extremity prosthesis in production, but no patients were wearing this type of prosthesis or in the process of being fitted during the visit. The process of filtering upper extremity prostheses is a specialty area that requires much experience.

Two nontraditional prostheses are in production by the AVI staff: a hip disarticulation and a shoulder disarticulation prosthesis. The rejection rate is very high on the part of the patient for both of these types of prostheses. Production of these prostheses may not be a good use of time and material, but it does provide a diversion from the routine.

### ***Wheelchair Production***

Wheelchair manufacturing is well organized, equipped, and managed. Standardized designs are produced in an assembly line. Staff members are able to customize chairs as needed to meet patients specialty needs.

### **Prosthetic/Orthotic Technical Staff**

The technical work done by Cambodian P&O professionals is impressive. The quality of workmanship, fit, and alignment is very good. The basic designs they are providing are what are taught in most P&O schools today and is entry level for today's prosthetics and orthotics practitioners. Use of design changes and incorporation of better componentry

come with experience. Because there is no input from more experienced staff (either physician, therapist, or P&O), the level of technology will not change. If anything, it will become diluted and decline. If the organizations the teams visited do not have exposure to research or access to changing technology, their gains will be limited due to the lack of stimulation. In the modern world, new information is passed on in training seminars, up-grade training sessions, professional literature, and mentoring. Similar mechanisms are required for Cambodia.

The two AVI prosthetists/orthotists have gained much experience and have helped to improve communication skills among their Khmer counterparts. They have worked hard and have addressed the needs of many patients.

It would be very difficult to find any one person who has all the skills necessary to take care of every patient he or she will encounter during his or her professional life. Cambodia has some very complex patients needing rehabilitation service. The degree of complexity has been increased because of factors such as the lack of proper medical services, untreated diseases, undertreated trauma, and birth defects. The fields of prosthetics and orthotics have become very specialized. Few CPOs practice both equally well. Each is also divided further into more subspecialties, such as spine, upper extremity, sports, child, adult, geriatric, cerebral palsy, burn, myoelectric, BK, AK, or developing world. For organizations engaged in prosthetics and orthotics work, rather than looking for a superprofessional, such organizations might try to using short-term assignments to focus more directly on identified technical needs. It might be possible to find volunteers, but they must be qualified. One or two years of experience is not enough. It takes a minimum of five years to gain proper independence either in prosthetics or orthotics if the proper work environment is provided. With focused

specialty training and with the level of competency the P&O Cambodia staff members already have, the instructor need not have much developing world experience. What is most important is that an instructor has recognized qualifications in a given area and the capacity to transfer knowledge and experience. With regard to setting up this training topics and timing must be established first. Then the search for the proper professional should begin.

VI/C and the projects could directly benefit from a full-time qualified Cat. I (CPO) to provide daily mentoring, but a great deal of his or her time would also be needed to coordinate the short-term training programs needed.

## **Facilities**

All facility sites the team visited were in good condition, well-equipped, well-maintained, orderly, and professional in appearance.

## **Community Follow-Up**

Follow-up is a necessary part of any comprehensive service delivery program. Generally the number of follow-up visits conducted per month is calculated based on a percentage of the total number of patients seen per month is established or randomized surveys are conducted. There are many methods of accomplishing the follow-up portion of the program. The most effective method of follow-up is for the patient to make a return visit to the treating facility. However, the patient and patient's family must appreciate the value of the treatment they have received in order for them to be willing to devote time and money to returning to the facility. If the patient does not believe that the treatment was valuable he or she will not return for follow-up treatment. By placing value on a treatment or device, if the patient and/or family believe that the treatment is of

value, they become active participants in the process. If not, a "take it or leave it" attitude is developed, and services are generally severely compromised and treatment plans may or may not be followed.

CFU efforts require traveling long distances only to find at times that the patients are not be home. A great deal of staff time is required, and the information gained may not affect the treatment plan or outcomes. The VI/C CFU project needs to be reassessed with clearer objectives outlined.

## **Patient Accommodations**

These facilities are well maintained. They seem to be very crowded and would probably not meet U.S. safety standards. Care should be taken to ensure that acceptable space is provided.

## **Management**

VI/C and the rehabilitation projects are being well managed. There are no signs, indications, or reports from employees of management problems. Reports are submitted and accounting practices are in place. Management tasks are carried out by both the national and expatriate staff. Cooperation with other NGOs is apparent. It is clear that VI/C takes responsibility for the daily management of the projects. It is unclear what MOSALVY's role and responsibilities are and which employees are paid for totally by MOSALVY. This assessment focused on the technical delivery of rehabilitation services, prosthetic/orthotic and physiotherapy, but the team saw no indications of problems in the management/administration area needing attention.

## **Sustainability**

(See Table on Suggestions to Address Sustainability.) This issue of sustainability has not been properly addressed by VI/C, DAC, the Government of Cambodia, or any other NGO that the team identify. Currently, the Cambodian government has no capacity to take on any responsibility regarding funding needs for rehabilitation services within the country. Operating budget contributions from governmental agencies are negligible. Furthermore, although cooperation between governmental and nongovernmental bodies is evident, there is no immediate prospect of turning over entire projects or even substantial components of present NGO-operated rehabilitation projects to MOSALVY or the MOH.

Apparently, DAC is having discussions regarding the sustainability of its own organization and the Ministry of Health has also put in place a cost recovery plan. The poor and disabled, and the monks are not expected to pay for services.

Discussions need to begin and developed a plan of action need to be developed now because it is unrealistic to believe that the United States can and will continue to provide funds indefinitely. The team discussed the need to place value on devices and services to more empower the patients' commitment to quality care. By using the same arguments and rationale that DAC is using to address its own situation, DAC should and could begin to address cost recovery of rehabilitation issues in Cambodia. VI/C, CSPO, and ICRC have begun to address the issue of technical and intellectual sustainability regarding prosthetics/orthotics delivery. Organizations such as Hope International are also addressing the issue of intellectual and technical sustainability by building up the medical/surgical infrastructure of the country. VI/C has the opportunity over the next two to three years to make its projects technically sustainable. Funding for materials and

equipment might be needed for some time. Some form of cost recovery program should be developed, but the first step is to place a value on the services provided and to provide that information to the patients, their families, and the Government of Cambodia. The determination of what an individual can or should pay is a social issue not to be confused with the treatment plan. For some, the amount will be very small, but others have resources, so payment needs to be scaled according to capacity. \$\$ for some and \$\$\$\$\$ for others.

## **Conclusions and Recommendations**

<b>Issue</b>	<b>Recommendation</b>	<b>Possible Delivery Mechanisms</b>
<p>Medical/surgical services and support</p> <p>Medical and surgical services require referral to Phnom Penh for simple surgery</p>	<ul style="list-style-type: none"> <li>• Training in basic procedures such as tendon lengthening, joint releases, stump revision, and skin grafting</li> </ul>	<ul style="list-style-type: none"> <li>• Physicians sent to Phnom Penh for training courses</li> <li>• Volunteer training at sites</li> </ul>
<p>Medical and services require referral to Phnom Penh for medical diagnostic workup</p>	<ul style="list-style-type: none"> <li>• Physician training</li> <li>• Laboratory technical training</li> <li>• Radiographic interpretation training—physicians, physiotherapists</li> <li>• Use e-mail and computer communication for interpretation of lab values, radiographic results (scanner)</li> </ul>	<ul style="list-style-type: none"> <li>• Training at satellites</li> <li>• Courses in Phnom Penh</li> <li>• Provision of scanner</li> <li>• Locate physician services to interpret patient information and test values from distance</li> </ul>
<p>Physiotherapy rehabilitation services are often the point when patients are initially taken into the medical system. Physical therapists are not equipped with diagnostic and clinical decision-making skills to screen for pathology and medical/surgical alternatives</p>	<ul style="list-style-type: none"> <li>• Training courses on specific pathologies focusing on clinical decision-making strategies</li> <li>• Clinical decision-making education</li> <li>• Medical/surgical alternative management for problems</li> <li>• Physiotherapy treatment alternatives for problems</li> </ul>	<ul style="list-style-type: none"> <li>• Formal continuing education courses in conjunction with other NGOs</li> <li>• Additional senior physiotherapist available for mentoring, supervision, and education among all sites</li> <li>• Continuing education courses along with physicians, P&amp;Os</li> </ul>

<b>Issue</b>	<b>Recommendation</b>	<b>Possible Delivery Mechanisms</b>
Physiotherapy graduates from the TSMC lack background scientific and theoretical knowledge to facilitate clinical decision making	<ul style="list-style-type: none"> <li>• Continue to work with DAC Physiotherapy Subcommittee to facilitate development of undergraduate training</li> <li>• Include background on pathology and medical/surgical diagnostics, treatment possibilities</li> </ul>	<ul style="list-style-type: none"> <li>• In-house mentoring</li> <li>• Translation of educational materials</li> <li>• Continuing education training courses</li> </ul>
Physiotherapy graduates from the TSMC are not exposed to clinical decision-making modeling, mentoring, or facilitation during training	<ul style="list-style-type: none"> <li>• Facilitate clinical decision-making strategies</li> </ul>	<ul style="list-style-type: none"> <li>• Short-term or long-term expatriate physiotherapy input and modeling</li> <li>• Clinical decision-making workshop</li> <li>• Include clinical decision-making focus in all continuing education courses</li> <li>• Select potential leaders and encourage development and leadership skills</li> </ul>

<b>Issue</b>	<b>Recommendation</b>	<b>Possible Delivery Mechanisms</b>
Physiotherapy staff do not practice reflective reasoning on effects of treatment, goal setting and determination of prognosis to assist with treatment planning	<ul style="list-style-type: none"> <li>• Focus on evaluation of efficacy of treatment, need for treatment, functional outcomes, and reflection on personal efficacy of treatment delivery</li> </ul>	<ul style="list-style-type: none"> <li>• Change focus of goal setting for grants, objectives of VI to decrease emphasis on output of devices and numerical statistics and increase emphasis on efficacy of choices of treatment and functional outcomes</li> <li>• Emphasize need to evaluate treatment efficacy during mentoring, staff meetings, and personal development interviews</li> <li>• Reward personnel showing advanced skills in this area</li> <li>• Re-evaluate promotion and staffing hierarchy to clearly identify administrative and professional functions</li> <li>• Establish separate promotion/reward systems for rehab workers and physiotherapists</li> </ul>
Insufficient physiotherapy staffing at Kratie	<ul style="list-style-type: none"> <li>• Increase number of physiotherapists</li> </ul>	<ul style="list-style-type: none"> <li>• Increase number of therapists</li> <li>• Limit administrative responsibilities</li> <li>• Physiotherapists are not sent on CFU</li> </ul>
CFU services are inefficient	<ul style="list-style-type: none"> <li>• Re-evaluate goals of CFU with respect to mission and vision of VI</li> </ul>	<ul style="list-style-type: none"> <li>• Establish priorities for choice of patients to be seen in the home related to efficacy and efficiency</li> <li>• Change focus of visits from checking status and use of prosthetics to goals necessary for function</li> </ul>
CFU goals do not provide rehabilitative outcomes	<ul style="list-style-type: none"> <li>• Establish clear rehabilitation goals for CFU based on discharge status and future patient goals</li> </ul>	<ul style="list-style-type: none"> <li>• Clear documentation of purpose of CFU on discharge</li> <li>• Improve communication between discharging professionals and CFU</li> <li>• Provide a mechanism for discussion of outcomes with discharging professionals and CFU</li> <li>• Mentoring of CFU workers with active demonstration of rehabilitation mechanisms in the home and community</li> </ul>

<b>Issue</b>	<b>Recommendation</b>	<b>Possible Delivery Mechanisms</b>
Functional re-education is limited	<ul style="list-style-type: none"> <li>• Continuing education on improving ADL skills, facilitation of function</li> </ul>	<ul style="list-style-type: none"> <li>• Mentoring</li> <li>• Continuing education course with focus on functional re-education</li> <li>• Use of functional outcomes for assessing progress</li> </ul>
Physical therapy space is crowded	<ul style="list-style-type: none"> <li>• Utilize other space for patients and families to work on their exercises</li> <li>• Use group interventions</li> </ul>	<ul style="list-style-type: none"> <li>• Scheduling</li> <li>• Senior therapists or mentor model effective organizational strategies</li> </ul>
Documentation of patient problems and related targeted interventions is poor	<ul style="list-style-type: none"> <li>• Mentoring and supervision of development of problem lists and solutions</li> </ul>	<ul style="list-style-type: none"> <li>• Individual mentoring sessions scheduled with expert/more experienced Physiotherapist</li> <li>• Continuing education focus on establishing primary and secondary causes of problems and related interventions</li> <li>• Clinical decision making workshops</li> <li>• Background theory workshops – pathology and related problems,</li> </ul>
Discharge plans and home programs are not specific to patient, patient's home situation, or future goals	<ul style="list-style-type: none"> <li>• Establish clear discharge plans and document in chart</li> </ul>	<ul style="list-style-type: none"> <li>• Focus on discharge plans specific to patient during in service and continuing education</li> <li>• Establish methods of communication with CFUs to provide opportunities to evaluate patient outcomes to improve future establishment of relevant discharge plans</li> </ul>

<b>Issue</b>	<b>Recommendation</b>	<b>Possible Delivery Mechanisms</b>
<i>Prosthetics and Orthotics</i> Short-term training and mentoring of P&O staff to upgrade services provided	<ul style="list-style-type: none"> <li>• Specialty training in methods of lower extremity orthotic management, i.e., cerebral palsy, Spinal Cord Injury, Stroke and Head Injury, etc.</li> <li>• Specialty training in the treatment of spinal disorders</li> <li>• Specialty training in area of upper extremity prosthetics</li> <li>• Specialty training in lower extremity prosthetics, i.e., socket designs, adaptations for higher level activities, sports, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide upgrade training and mentoring utilizing qualified volunteers. Possible collaboration with professional organizations such as AAOP, ACPOC, APTA and/or ISPO. Affiliations with Schools of Physical Therapy or Prosthetics and Orthotics are also possible</li> </ul>
The incorporation of newer orthotic designs and componentry	<ul style="list-style-type: none"> <li>• Addition of orthotic components and designs that will increase functional outcomes</li> </ul>	
Mentoring of current prosthetic and orthotic staff	<ul style="list-style-type: none"> <li>• Employ a full time qualified ISPO Cat. I P&amp;O</li> </ul>	<ul style="list-style-type: none"> <li>• Full-time oversight is currently needed. Utilization of Cat. I CPOs within VI or contract with local NGO's are short term solutions.</li> </ul>
Establish a clinical teaching center within VI/C	<ul style="list-style-type: none"> <li>• Kien Khleang should become the clinical teaching center for all P&amp;O upgrading efforts for VI/C</li> </ul>	<ul style="list-style-type: none"> <li>• Volunteer teaching and mentoring should focus on Kien Khleang and then branch out to the other centers</li> </ul>
Wheelchair production	<ul style="list-style-type: none"> <li>• Explore the possibility of transferring wheelchair production to a free standing facility not under Kien Khleang/VI</li> </ul>	<ul style="list-style-type: none"> <li>• Establish an independent corporation marketing and manufacturing wheelchairs for Cambodia and the region</li> </ul>

<b>Issue</b>	<b>Recommendation</b>	<b>Possible Delivery Mechanisms</b>
Foot production	<ul style="list-style-type: none"> <li>• Explore the possibility to transfer foot production outside VI control</li> </ul>	<ul style="list-style-type: none"> <li>• Transfer foot production to ICRC/Cambodia</li> </ul>
Placing a dollar value on P/O and rehabilitative services	<ul style="list-style-type: none"> <li>• Establish a realistic purchase price for services</li> </ul>	<ul style="list-style-type: none"> <li>• Set a dollar value on all services provided</li> </ul>



## **Suggestions to Address Sustainability**

<b>Issue</b>	<b>Recommendation</b>
<p>Patients are often at rehabilitation centers for extended periods of time—particularly Kien Khleang. The following are among the reasons for extended stay:</p> <ul style="list-style-type: none"> <li>• waiting for surgery</li> <li>• clubfoot management</li> <li>• contracture management</li> </ul>	<ul style="list-style-type: none"> <li>• Evaluate options to decrease length of stay (early surgery for clubfeet, contractures, possible surgical training of physicians at distant sites)</li> <li>• Increase intensity of treatment for identified patients</li> <li>• Waiting lists</li> </ul>
<p>Patients receive full support for transportation, food, medication, surgery if necessary and rehabilitation</p>	<ul style="list-style-type: none"> <li>• Investigate options for patient contributions—financial contributions, food support at the sites, work contributions to functions of sites by family</li> </ul>
<p>Patients are admitted to the rehabilitation centers for extended periods of time</p>	<ul style="list-style-type: none"> <li>• Evaluate treatment methods to allow selection of efficient options</li> <li>• Investigate options to prioritize treatment</li> <li>• Develop prognostic and evaluation skills of therapists to assist with determination of treatment plateaus, lack of improvement, and situations where physical rehabilitation is not suitable</li> <li>• Establish functional and impairment goals that are used for comparative purposes on a regular basis and re-evaluate status on a daily basis</li> <li>• Communicate goals and progress toward goals in chart</li> </ul>
<p>Patients with poor prognosis are not correctly identified and compensatory mechanisms not used</p>	<ul style="list-style-type: none"> <li>• Use physiotherapy evaluation to “screen” patients for prognosis based on pathology and select patients who are likely to benefit from rehabilitation, e.g., admission of patients with stroke occurring two years previously may not be time efficient if the patient is admitted without significant improvement or teaching the family management techniques</li> </ul>

Issue	Recommendation
<p>Prostheses and orthoses are replaced frequently.</p> <ul style="list-style-type: none"> <li>• Adaptations for growth or possible change in physical status not included in initial design</li> <li>• Limited awareness of alternatives for adjustments of prostheses/orthoses by orthopedic technologists</li> <li>• Appropriate designs/adjustments to protect prostheses/orthoses for use on rugged terrain are not often used</li> <li>• Use of different size stump socks not standard</li> </ul>	<ul style="list-style-type: none"> <li>• Training on alternatives for adjustment of devices rather than replacement</li> <li>• Change facility goals from production of devices to delivery of services</li> <li>• Spot checks are performed by professional staff to evaluate efficacy and need for replacements</li> <li>• Spot checks are performed by professional staff to evaluate the efficacy of functional rehabilitation to minimize compensations or abuse of devices</li> <li>• Education of care of devices</li> </ul>
<p>Goals of follow-up visits not always clear</p>	<ul style="list-style-type: none"> <li>• Re-examine purpose of follow-up visits and determination of suitability for active follow-up</li> <li>• Establish clear treatment goals from early in-patient rehabilitation to discharge</li> <li>• Clearly communicate goals of follow-up in chart</li> <li>• Documentation of progress toward goals by follow-up worker</li> <li>• Progress discussed by team and importance of need for follow-up emphasized</li> <li>• Determination of possible reasons for change from active to passive to discharged status</li> </ul>
<p>Follow-up visits require considerable personnel time and are not efficient (time or distance)</p>	<ul style="list-style-type: none"> <li>• Establish patient buy-in and commitment prior to being fitted for a device</li> <li>• Establish links with local community leaders who can check on status and communicate need to return for services as part of daily activities but do not require transportation or additional time (perhaps provision of cell phones)</li> <li>• Evaluate the true effectiveness of follow-up visits if patients are unlikely to take time off to return for services even if identified as needing adjustments to devices</li> <li>• Only use follow-up visits if status is likely to change or functional rehabilitation in the home environment is necessary</li> </ul>
<p>Training requirements and support of follow-up personnel extensive with turnover, suitability considerations</p>	<ul style="list-style-type: none"> <li>• Clarify the goals of the follow-up program and narrow focus of training if the primary focus is contacting patients</li> </ul>

Issue	Recommendation
Follow-up visits for the purpose of recording success of interventions require evaluation of results at a higher level than numerical data	<ul style="list-style-type: none"> <li>• Use statistical sampling rather than evaluating all recipients of services</li> <li>• Only follow-up if patients do not return for adjustment of devices in cases likely to be changing</li> <li>• Only use professional staff if complex cases involved with limited mobility options and a need for functional rehabilitation in the home are identified</li> <li>• Use specialist services and/or train professional staff to evaluate efficacy of interventions and suggest alternative methods</li> </ul>
Information from follow-up visits not communicated to therapists or prosthetist/orthotist to allow adjustments in treatment protocol or options	<ul style="list-style-type: none"> <li>• If the purpose of the follow-up is to evaluate the efficacy of treatment, develop evaluative skills of professional staff performing follow-up visits to develop changes in overall treatment strategies or options (requires higher level thinking skills and evaluative components)</li> </ul>
Patients are not expected to contribute to their rehabilitation financially or in kind (perhaps building expectations, setting precedents)	<ul style="list-style-type: none"> <li>• Investigate options in which patients will contribute in some format to their rehabilitation</li> </ul>
Long-term technical sustainability will require improving professional services of both graduates from the training programs (curriculum, teacher training, clinical instruction) and present professional staff (VI and other facilities) for pool of potential staff.	<ul style="list-style-type: none"> <li>• Continuing education courses in identified areas taught by specialists (unlikely to find professional staff with expertise in all areas)</li> <li>• Clinical mentoring</li> <li>• Include Physiotherapy school instructors in all continuing education courses</li> <li>• Continue to communicate and organize educational resources with other NGOs</li> <li>• Share professional staff across NGOs</li> </ul>
Long-term technical sustainability will require developing professional leaders	<ul style="list-style-type: none"> <li>• Identify potential Khmer leaders</li> <li>• Include Khmer professionals in development activities to be mentored by present Expatriate professional and technical leaders (DAC, subcommittees, training organization)</li> <li>• Provide opportunities for continuing education in technical /professional development and leadership development</li> <li>• Recognize and reward initiative, creative thinking and negotiation skills</li> </ul>
Increasing contributions from parties other than USAID need to be explored including VVAF, MOSALVY, MOH	<ul style="list-style-type: none"> <li>• Develop a progressive annual plan to decrease funding support from USAID</li> <li>• Investigate options that might provide long term financial support (investments by VVAF/private donors)</li> </ul>

<b>Issue</b>	<b>Recommendation</b>
Potential funding options for technical components need to be explored ( wheelchair workshop)	<ul style="list-style-type: none"> <li>• Privatization or hand over to local management for wheelchair enterprise</li> </ul>
Re-evaluate strategic plan and overall goals of organization to determine if too broad a scope is being attempted	<ul style="list-style-type: none"> <li>• Narrow focus to provision of rehabilitation services</li> <li>• Identify other community links who may be able to provide accessibility or community services such as income stimulation, education services</li> <li>• Refer other community services out rather than attempting to manage all community inclusion issues</li> </ul>

## **Appendix 1: Terms of Reference**

The consultants are expected to assist in the program evaluation and development especially with reference to the request for the two-year extension of funding beginning January 1, 2002 and ending December 31, 2003. Three project, Kien Khleang, Prey Veng, and Kratie will be evaluated.

Veterans International ( Vietnam Veterans of America Foundation ) began work in Cambodia at the Kien Khleang facility in 1992 providing the aluminum Jaipur prosthetic limbs in order to help meet the needs of a country who had lost any capacity to provide rehabilitative services due to a internal on going war. It was recognized that there were many that could not benefit from orthotic or prosthetic services and wheelchair production was started at the Kien Khleang Center. As needs changed and other services became available VI/C switched to polypropylene technology in 1995.

Because of an expanding service requirement VI/C introduced extensive physical therapy and follow-up services to their programs at the same time the project was expanding out to other areas in the country. The National School of Physiotherapy utilizes VI/C facilities for placement of internships and postgraduate training.

The war has ended but unexploded munitions and land mines continue to kill and injure an unacceptable number of primarily civilians each year. The number needing services has slowed and only slight increases are anticipated in the 2002-2003 project years. More and more Cambodians are finding their way to treatment facilities. The emphasis on prosthetics for the amputee population has changed to include orthotics. The complexity of the cases seen has increased requiring greater technical demands and necessitating better follow-up procedures.

Sustainability on a national scale does not appear realistic for the near future. VI/C reports significant progress towards professional technical and management staff sustainability. A VI/C expatriate CPO is no longer onsite to provide direction or mentoring, this role has been undertaken by Australian Volunteers International.

A technical assessment of the orthotic/prosthetic and rehabilitation services provided by VI/C has not been undertaken until now. This technical assessment will:

- assess the quality of orthotic/ prosthetic and rehabilitation services by examination of patients who have received services through VI/C projects

- assess the quality of orthotic/prosthetic and rehabilitative services received in-house by observing work in progress
- determine if appropriate medical/surgical services are available if needed
- determine the appropriateness of service provided, are the needs of the patients being served
- assess physiotherapy training and capacity to serve as a internship and post graduate training site
- assess wheelchair and foot production
- assess the work flow and timeliness of service provide
- assess inventory control and availability of needed materials and components
- determine if workshop safety is appropriate for staff and patients
- assess the impact of the program in providing rehabilitative services to those with physical disability
- determine if appropriate medical/treatment records are maintained
- assess the effectiveness of follow up services and its impact
- assess the technical and administrative capabilities of staff
- assess communication and coordination with all partners
- assess recruitment and training of staff
- include staff interviews to aid in determining capacity
- review the achievement of the programs

- review proposed expansion of services into other provinces
- evaluate the sustainability of the programs

For the development of the program the consultants will:

- make specific recommendations regarding any concerns or deficiencies identified
- identify any method, techniques, procedures that will have benefit to other LWVF projects
- provide a written report of all findings of the project evaluation



## **Appendix 2: Contacts**

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<b>Name of Person</b>	<b>Position/Organization</b>
Lee Forsythe	USAID, Humanitarian Assistance Programs, Cambodia, Laos, Vietnam
Dr. Kevin Rushing, DVM	USAID Chief, Office of General Development
Lisa Chiles	USAID, Mission Director
Larrie Warren	Veterans International Cambodia, Country Director
Claudie Ung	Veterans International Cambodia, Rehabilitation Coordinator
Josefina McAndrew	Veterans International Cambodia, Associate Director for Administration
Jo Nagels	Veterans International Vietnam, Rehabilitation Program Manager
Hing Channarith	VI/C, Kien Khleang Physical Rehabilitation Center, Manager
Nuth Hourn	VI/C, Kien Khleang Center, Supervisor Prosthetics and Orthotics
Three Senior Prosthetists/Orthotists	Kien Khleang Center
Ee Sarom	VI/C, Kien Khleang, Supervisor Physiotherapy
Mel Many	VI/C, Kien Khleang, Supervisor Foot Production
Yem Senghai	VI/C, Kien Khleang, Supervisor Wheelchair Production
Hak Bony	VI/C, Kien Khleang, Supervisor Dormitory and Kitchen
Khloth Sareth	VI/C, Prey Veng Rehabilitation Center, Site Manager
Sai Kim San	VI/C, PREY VENG, P&O Supervisor
Sarah Cock	AVI, Prey Veng, Prosthetist/Orthotist
Ull Meng Hour	VI/C Prey Veng SPC Supervisor
Phlong Sinath	VI/C Prey Veng Physiotherapist
Hun Rath	VI/C Prey Veng Physiotherapist
Hort Seila	VI/C, Kratie Physical Rehabilitation Center, Site Manager

Nom Channa	VI/C Kratie, Prosthetist/Orthotist
Jim Lavranos	AVI Kratie Prosthetist/Orthotist
Sin Sokunthy	VI/C Kratie, Physiotherapist
Bak Tokyo	VI/C Kratie, Physiotherapist
William Velicky	Cerebral palsy, CSPO/CT, Principal
Ouk Sisovan	Disability Action Council, Executive Director
John Zeffer	Cerebral palsy, American Red Cross, Physical Rehabilitation Program Coordinator
Jean-FranHbis Gallay, CPO	International Committee of the Red Cross, Head of Physical Rehab.
Dr. Carolyn Sunners	HealthNet, Provincial Health Coordinator Kratie Province
Dr. Ricaredo D. De La Costa	Hope Worldwide, Orthopedic Surgeon
Dr. Graham Gumley	Hope Worldwide, Executive Director
Suzanne Gumley	Hope Worldwide, Public Relations Director
Dr. Jim Gollogly	Rose Charities, Head of Delegation

## **Appendix 3: Evaluation Schedule**

<b>Date</b>	<b>Activity</b>
Sunday Sept. 30	Arrival 1745 Phnom Penh, Cambodia USAID pickup and transfer to Sunway Hotel 1845 Larrie Warren to stop by hotel
Monday Oct. 1	0730 Breakfast meeting Sunway hotel with VI/C staff 1000-1130 Briefing with USAID 1400-1600 Briefing with VI Staff 1900 Dinner and discussions
Tuesday Oct. 2	0730 Breakfast meeting 0800 Depart for full day at Kien Khleang Visit Rose and Order of Malta 1930 Dinner with DAC and Lee
Wednesday Oct. 3	0730 Breakfast meeting 0800 Depart for day Kien Khleang CFU visits Dinner with VI Staff
Thursday Oct. 4	0700 Breakfast meeting 0730 Depart for trip to Prey Veng 1100-1700 Visit Prey Veng Center and Provincial Hospital 1900 Dinner with VI and Prey Veng expat staff
Friday Oct. 5	0700 Breakfast meeting 0800 Depart for Prey Veng CFU Visits 1400 Depart for Phnom Penh 1900 Dinner with VI Staff
Saturday Oct. 6	0800 Breakfast meeting 0830-1200 Review week's activity and findings 1200 Meeting with CSPO, Bill Velicky

<b>Date</b>	<b>Activity</b>
	1900 Dinner with Bill Velicky
Sunday Oct. 7	Free
Monday Oct. 8	0730 Breakfast meeting 0800 ICRC 1000 CSPO 1400 Kim to HI School of Physical Therapy 1400 Mel to Kien Khleang meeting with senior P&O staff 1600 Security briefing USAID office 1930 Dinner meeting Larrie
Tuesday Oct. 9	0600 Breakfast meeting 0630 Depart by boat to Kratie 1400 Visit Kratie Center 1900 Dinner with VI and Kratie expat staff
Wednesday Oct. 10	0700 Breakfast meeting 0800 CFU visits around Kratie 1400 Return Kratie Center discussions with staff 1900 Dinner with VI and Kratie Expat staff
Thursday Oct. 11	0700 Depart for Kampong Cham 1300 Visit HI workshop with Lee 1400 Depart for Phnom Penh 1600 Debrief USAID Staff 1900 Dinner with Larrie and Lee
Friday Oct. 12	0730 Breakfast meeting 0800 Hope Worldwide, Sihanouk Hospital 1000 Debrief VI/C staff 1300 Lunch with VI/C Staff 1400 Return to hotel, pack, prepare for departure 1600 USAID pickup for airport 1845 departure

## **Appendix 4: Physical Therapy Issues**

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**Kim Dunleavy MS, PT, OCS**

<ul style="list-style-type: none"><li>• Extent of professional training—pathology detail and content</li><li>• Depth of physical therapy intervention options</li><li>• Identification of primary and secondary problems</li><li>• Determination of treatment goals</li><li>• Selection of interventions related to functional goals</li><li>• Functional training</li><li>• Critical thinking skills</li><li>• Re-evaluation of treatment progress</li><li>• Evaluation of treatment efficacy and modification of treatment</li><li>• Patient advocacy and referral to other professionals</li></ul>
<ul style="list-style-type: none"><li>• Lack of medical/surgical support for initial evaluation and for referral</li></ul>
<ul style="list-style-type: none"><li>• Critical thinking skills of graduated physios</li></ul>
<ul style="list-style-type: none"><li>• Khmer professional leadership</li></ul>
<ul style="list-style-type: none"><li>• Graduated physios employed in hospitals—exposure and knowledge of rehabilitation pathologies and interventions</li></ul>
<ul style="list-style-type: none"><li>• Freezing of hospital posts</li></ul>
<ul style="list-style-type: none"><li>• Salary structure and incentives in hospital positions</li></ul>
<ul style="list-style-type: none"><li>• Language barrier to obtain reference material—books, computers</li></ul>
<ul style="list-style-type: none"><li>• Terminology (French/English)</li></ul>
<ul style="list-style-type: none"><li>• Professional interaction (peer)</li></ul>

Additional information or copies of this report can be obtained through the Leahy War Victims Fund website at <http://www.leahywarvictimsfund.org>