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 **BASICS**  
**TRIP REPORT**

**USAID WAR VICTIMS' FUND**  
**VIETNAM COUNTRY PROGRAM EVALUATION**

***BASICS is a USAID-Financed Project Administered by The  
Partnership for Child Health Care, Inc.:***

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**Management Sciences for Health (MSH)**

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**OCTOBER/NOVEMBER 1993**

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## **I. SUMMARY FINDINGS**

The purpose of the evaluation is to judge whether the individual activities for physically disabled war victims, and the sum of those activities, in Vietnam are well suited to the purposes of the War Victims' Fund. A second purpose is to derive lessons and to gain perspective for a comprehensive assessment of the world-wide war victims program. Specifically:

A: Does the selection of activities match well the needs of war victims in Vietnam? Fairly well.

Clearly, there are many people in Vietnam who lost limbs during the wars of the last half century. The program has reached a large portion, probably more than half of the amputees. There seems to be unmet need for wheelchairs for double lower limb amputees, and for assistance for polio patients as well.

1: Are there significant numbers of war victims with needs other than prosthetics?

Yes. The people with mobility disabilities other than missing limbs (e.g., polio which occurred because the immunization program failed during the war), and people with sensory disabilities are generally not being served by the program. Even people with missing limbs are probably not being served by the rehabilitation centers if they live far away or in difficult to reach locations.

The Ministry of Health's Community Based Rehabilitation Program may be more able than MOLISA to assess needs other than prosthetics, or to reach people without easy access to MOLISA's rehabilitation centers.

2: For war victims needing prostheses, is there an appropriate balance between provision of prostheses and other services, e.g., orthopaedic surgery, physical therapy or vocational rehabilitation?

No. Prostheses and orthopaedic surgery are generally available, the former through MOLISA and the latter mainly through the Ministry of Health for trauma emergency cases and MOLISA for other cases. Physical therapy and vocational rehabilitation have very limited availability and appear to have low effectiveness.

3: Is community rehabilitation an appropriate strategy at this time? What resources and effort would be needed to move more deliberately in this direction possibly, as a complement to MOLISA's program?

Community-based rehabilitation (CBR), drawing on WHO's model and experience from the Philippines, is operating in twelve provinces in pilot districts. Training materials and a system of training and supervision from the national to the commune have been tested and are being used in the program. CBR may be able to reach

populations which seem beyond the outreach of the MOLISA system. CBR emphasizes physical therapy and vocational rehabilitation.

- 4: Do USAID-funded activities fit well with national activities or activities supported by other donors?

Yes, services for amputees are an important priority for the government; however, our information is inadequate to be sure about the fit with other donor programs.

- 5: Are there substantial unmet needs, currently and in the foreseeable future?

Yes, there are fundamental needs in medical education underlying orthopaedic surgery, and in all aspects of rehabilitation. There is need to improve technology for prosthetic feet which wear out too quickly.

- B: Do the activities provide direct and visible benefits, as an expression of American interest in the welfare of the war victims?

Yes.

- 1: Are the victims receiving the kinds of services they want?

Yes. Although rural people want both a prosthetic foot that will function in the rice paddies (perhaps a peg), and another prosthetic foot for social interaction.

- 2: Are the benefits significant and lasting?

Yes. The benefits are clearly significant. Prostheses have limited durability, however. Current technology provides prostheses that last about three years, and feet that last no more than a year. Many of the amputees are in the 30-60 years age group; they will require numerous replacements of prostheses during their lifetimes.

- 3: Do most victims have access to the benefits?

Probably but we can't be sure until there is better information about the number and location of war victims.

- 4: Is America recognized as a source of support?

Yes.

- C: Are the methods, materials and skills appropriate to the resources of the country?

Yes for prosthetics, except the PRF project which is dependent on imported components. Orthotics is not yet developed. Orthopaedic surgery is at least a

generation out-of-date; surgical practices and equipment need upgrading from a low level. Some surgery courses from the developed world have been far too advanced.

- 1: Are the individual activities designed well to achieve their purposes?

Yes, except for PRF.

- 2: Are the designs being implemented?

Yes.

- 3: Are the assumptions underlying the designs valid, e.g., availability of imported supplies, or accessibility of services, or functionality of device types?

Yes, with two exceptions. First, the PRF program has no plan yet for switching to locally available materials and locally made components; although, the recent grant renewal by USAID requires PRF to reduce reliance upon imported prosthetic materials. Second, the difficulty of organizing outreach and integrating outreach with the production targets has been under-estimated. As the easier to reach amputees are served, outreach to the others will be increasingly important and expensive.

- D: Are the activities and the program properly managed?

Yes; however, the team was unable to judge the management of VNAH. The VNAH system for delivering prostheses deserves further attention considering technical and funds accountability objectives.

- 1: Does the combination of grantees, USAID/Bangkok and USAID/W Office of Health management structure provide appropriate direction and oversight?

Yes, despite the significant inherent difficulties of managing complex national activities with local disbursements of funds, and without having the USAID Mission in the country. Each trip to Vietnam by USAID staff requires authorization from the State Department in Washington. The State Department has twice denied permission for the USAID/RSM Controller from Bangkok to travel to Vietnam to conduct a financial review of the War Victims' Fund grantees.

- 2: Are finances properly managed?

The team saw no evidence of financial mismanagement by the grantees or the implementing organizations. The team raises a question about having different payment/reimbursement systems for VNAH and World Vision. When the PRF system switches to local production of components, a new and appropriate payment/reimbursement system will also be needed for this project.

3: Are the controls/incentives for quality adequate?

No. The push for more production has been successful and is important, but quality has suffered.

E: Is it likely that the activities can and will be sustained to meet the continuing needs of war victims after external funding ceases?

The government's program has been functioning for many years and is becoming a strong institutional network; it will continue without external funding, but on a reduced scale. There may be a long-term issues about the division of responsibilities between the MOLISA and the MOH.

1: Are the current indigenous sources of support likely to be adequate in the foreseeable future?

No, but without better information about the number of amputees we cannot estimate the shortfall. With estimates of amputees of up to 200,000 persons, annual production of prostheses now around 15,000, and three-year for limbs, there appears to be a substantial shortfall in production. The World Vision survey suggests that the total number of amputees is much lower, 75-100,000. If production increased to the current production capacity of the national system, the supply of prostheses might be adequate to keep up with the demand for replacements.

2: Could support come from the private sector? What share of costs might be covered from user fees? What portion of need might be met on a commercial basis?

The existing system provides for co-payment from civilians and ARVN (South Vietnamese) veterans. Currently, because of the funding coming from donors, co-payments are being waived. Most amputees have very low incomes, and may be unable to pay, even for transportation costs. Further expansions of production, paid by donors, may be less expensive if contracted to the private commercial sector, rather than adding more centers or trying to expand production capacity at existing centers.

3: Will indigenous human resources be adequate in the future?

No.

4: Should more current resources be invested in training?

Yes.

**F: What are the team's recommendations for any future support from the War Victims' Fund?**

**1. Would longer time-frames for planning and support of activities enhance the prospects for success and sustainability?**

**Yes.**

**2: Is it essential to have more information about war victims and their needs?**

**Yes.**

**3: How important is it to have an explicit country plan?**

**Very important, now that the current limits of the production capability are being reached. The potential for duplication of effort between the MOH and MOLISA argues for both ministries to collaborate in preparing a national plan.**

**4: Should other donors be part of a planning process?**

**USAID should, at least, have a clearer picture of what other donors are able to contribute. Existing U.S. policy toward Vietnam limits the USAID involvement to the U.S. NGOs, precluding any active role with the Vietnamese government agencies at this time.**

**5: Are there any essential program changes the team would want to see if additional resources were available?**

**Yes, the four following changes:**

- More attention to outreach and rehabilitation.**
- Improvements in orthopaedic technology. (Current orthopaedic practices are causing harm.)**
- Rationalizing the different payment systems for World Vision and VNAH.**
- Shifting the PRF program away from imported components to indigenous production.**

**6: How could program management be strengthened?**

**On the part of USAID/Bangkok, senior mission officers should make regular, routine visits to Vietnam for program monitoring and especially to reinforce the programmatic and management guidance provided to grantees by the able PSC employed by the Mission to manage this entire program. The War Victims' Fund program manager at the Office of Health should be in regular contact with a senior**

USAID/Bangkok Mission officer to supplement the more frequent contact with the PSC program manager.

VNAH needs more in-country staff so prostheses can be delivered steadily and without long delays.

- 7: Are there important missed opportunities for cooperation or collaboration or transfers of experience among the projects in the country?

Yes, there is widespread interest in having more opportunity to learn from experience from other centers. The team suggests regular meetings/workshops to bring together the managers and the professional staff of the centers throughout the system, perhaps semi-annually. These gatherings may also serve as opportunities for training. These gatherings hopefully may contribute as well to a stronger sense of professionalism and to inculcation of quality standards. The in-country donor representatives and experts should participate in these meetings.

- G: Are there lessons to be drawn of use to the worldwide program or to other countries?

- 1: Given the spectrum of prosthetic technologies being used in Vietnam are there lessons about appropriate technology?

Well-functioning, reasonably durable and inexpensive prostheses are being made from materials in Vietnam. The usefulness and comfort of these devices is more dependent on the skills of prosthetists and technicians than on the materials or equipment being used. The one component that needs better materials is the foot used in rural and wet conditions; however, imported feet are no more durable than locally produced feet. There is an urgent need for research to develop a more durable foot.

- 2: Is the Vietnam country program a useful model? What are the main strengths and weaknesses?

The main strength of the Vietnam program is the high priority given by the government to providing prostheses to war victims, at least to veterans of the North Vietnamese Army. To do so, however, the program has been divorced from the Ministry of Health which is concerned with the welfare of the total population and might give this effort lower priority. MOLISA is not doing a good job yet with outreach. After there is more complete information about the amputee population, MOLISA policies may be seen to discriminate against civilian and South Vietnamese Army veterans. The MOH would be better equipped to service remote amputees and might be more even-handed in delivering services to all amputees.

## **II. BACKGROUND INFORMATION**

The population of Vietnam, with the North and South now unified, is about 71 million. Long-neglected and damaged infrastructure is still in bad shape. Travelling and transport is difficult and slow. There are 53 provinces with 60 main hospitals and 500 district hospitals. Each administrative level—national, province, district and commune—is governed by an elected People's Committee.

The Ministry of Labor, Invalids and Social Affairs (MOLISA) was formed after 1975 by combining the Ministry of Labor and Social Affairs with the military agency for disabled veterans. MOLISA estimates there are 4 million handicapped people in Vietnam, about five or six percent of the population. The government's policy is to give priority to services for the disabled, especially those who are war victims. MOLISA is responsible for rehabilitation of the physically disabled, giving first priority to military (North Vietnam) veterans and government employees. MOLISA estimates that 200,000 people (.3 percent of the population) have lost limbs.

Following discussions that began in 1987 between the Government of Vietnam and the Vessey Commission from the United States, the U.S. Agency for International Development (USAID) solicited proposals from non-governmental organizations to provide assistance for disabled war victims in Vietnam. Beginning in 1990, grants were made to four U.S. NGOs:

- World Vision,
- Prosthetic Research Foundation, Seattle,
- Viet Nam Assistance for the Handicapped, initially through the World Rehabilitation Foundation, and
- Health Volunteers Overseas.

The first two organizations had previously begun working in Vietnam.

These activities are authorized and managed by the USAID/Bangkok Regional Office, with funding and guidance from USAID's Office of Health which manages a world-wide fund for War Victims. The War Victims' fund, initiated by the U.S. Congress, provides about \$5 million each year which is distributed among programs in twelve countries. Vietnam is the recipient of the largest amount of funds.

## **III. EVALUATION TEAM AND ITINERARY**

The evaluation team was provided by the Office of Health as part of a world-wide evaluation of the War Victims' Fund. There were six members: three certified prosthetists/orthotists, one orthopaedic surgeon, and two program management specialists with USAID experience. The visit was authorized and coordinated by Mr. Tue, Deputy Director, Dept. of International

Relations, MOLISA. The visit was organized effectively and supported by World Vision: Daniel Watkins, CPO, David Trees, Mr. Binh and Mr. Minh. For the first week, the team was divided into two groups. One group began in Hanoi:

Robert Simpson	program management specialist
Dr. Frank Gottschalk	Assoc. Professor of Orthopaedic Surgery, University of Texas, Southwestern Medical School, Dallas
Daniel D. Ramsey	Certified Prosthetist/Orthotist, The Duluth Clinic, Duluth, Minnesota

This group, together with Dr. Tran Danh Huynh, an orthopaedic surgeon responsible for training and research at the Orthopaedic and Rehabilitation Institute in Hanoi, and David Trees of World Vision/ Hanoi visited:

*October 25: Hanoi*

Orthopaedic and Rehabilitation Institute (PRF, Seattle)  
Health Volunteers Overseas

*October 26: Thanh Hoa*

Thanh Hoa Rehabilitation Center (World Vision)  
Thanh Hoa General Hospital

*October 27: Vinh*

Vinh Rehabilitation Center (World Vision)

The second group started in Ho Chi Minh City and traveled in the South:

Charles Johnson	program management specialist
Mel Stills	President of the International Society of Prosthetists and Orthotists; Asst. Professor, Dept. of Orthopaedic Surgery, The University of Texas Southwestern Medical Center, Dallas
Michael Schuch	CPO, Asst. Professor and Director, Dept. of Prosthetics and Orthotics, Duke University Medical Center, Durham, North Carolina

This group, accompanied by Mr. Cuong from MOLISA and Mr. Binh from World Vision, visited:

*October 25: Ho Chi Minh City*

Thu Duc Rehabilitation Center (VNAH)

*October 26: Can Tho*

Can Tho Rehabilitation Center (VNAH)

*October 27: Ho Chi Minh City*

HCM City Rehabilitation Center (ICRC)  
Polio Rehabilitation Hospital

*October 28: Quy Nhon*

Quy Nhon Rehabilitation Center (World Vision)

On October 29, both groups met in Da Nang. Daniel Watkins, CPO, of World Vision, coordinated arrangements for the team. Watkins is now resident in Da Nang. On October 30, the two groups visited the Da Nang Rehabilitation Center. On Monday, October 31, Stills, Gottschalk, Schuch and Ramsey began teaching a six-day course on prosthetics and orthotics to staff from nine of the MOLISA Rehabilitation Centers. The course was opened by the Vice Minister of Social Affairs, Mr. Chu Tich Doan. On Monday, the team briefed Mr. Tue from MOLISA on the team's findings and discussed some tentative recommendations.

#### **IV. ASSESSMENT OF THE NEEDS OF THE DISABLED**

##### **A. Humanitarian and Developmental Goals**

The legislation establishing the War Victims, Fund expresses concern about the immediate problems of individuals disabled as a result of armed conflicts. In most countries where the fund has been used, this Congressional concern has been translated into humanitarian programs to provide an initial prosthetic device to amputee victims of wars and other civil disturbances. Unfortunately, because prosthetic legs have a short useful life, typically three years, the problem facing amputees is recurrent for a life time. The problems faced by the humanitarian NGOs are complex and demand sustained solutions.

In Vietnam, the initial grants to World Vision, PRF, and WRF/VNAH were of one to two years duration. Their purpose was humanitarian, that is, providing prosthetic and orthotic devices. The second round of grants to World Vision and VNAH cover a three year period from October 1, 1993 through September 30, 1996. The grant to PRF, which also has a research purpose, is for two years. The focus remains on increasing production of prosthetic and orthotic devices, with limited funds available for training and technical assistance.

The grantees are caught in a bind. Their grants are primarily for humanitarian purposes while the problem is equally a development assistance problem, that is, developing a sustainable prosthetics and orthotics capability in Vietnam, with a long-term plan for training, expanding production, and improving quality of services. By continuing to provide assistance for short periods of time and for humanitarian purposes, the grantees are not able to assist the

government in developing the policies and sustainable programs required to meet the needs of the large disabled population. It is the familiar conflict best described by the old saying "Give a man a fish and he will eat today; teach him to fish and he will eat the rest of his life".

There is no clear guideline as to when the U.S. assistance for prosthetic and orthotic devices could end. The present need in Vietnam may be many times the current capacity of MOLISA and the USAID grantees, namely 3-6 times annual current production, so from the humanitarian assistance viewpoint, there is a large long-term need. From the developmental assistance viewpoint, there is also a substantial long-term need to up-grade the technical skills of current prosthetics and orthotics technicians, develop and implement a training program for the next generation of prosthetists and orthotists, up-grade the quality of devices and services, and possibly expand production capability to meet demand.

#### **B. Current Information about Disabled War Victims and Their Needs**

There are no reliable estimates of disabled war victims to guide planning or assessment of programs. USAID is funding prosthetics programs in Vietnam on the premise that the number of limb amputees substantially exceeds current production and delivery of prosthetic devices. The team has no evidence which would refute the premise; however, there is enough uncertainty about any and all of the available estimates to make the team very uneasy about continued reliance on the information provided by MOLISA. MOLISA tells us that there are approximately 200,000 limb amputees in Vietnam, of which about 30 percent are (North) Vietnamese Army veterans. MOLISA has been unable to provide information which corroborates the estimates. World Vision did a survey of 25,000(?) people and identified 737 limb amputees; by extrapolating this data, World Vision estimates limb amputees in Vietnam total between 70,000 and 106,000. Some thousands more are being added to the total each year from causes which include stepping on old land mines, highway accidents, workplace accidents, and amputations resulting from chronic illnesses. MOLISA points to recent amputees who returned from the more recent conflicts in Kampuchea. In addition, the number of disabled persons whose mobility is significantly impaired is probably several times higher than the number of amputees; this group appears to include substantial numbers of persons in need of orthotic devices because of polio, cerebral palsy, and perhaps some survivors of spinal cord injuries.

In Vietnam, as in other countries assisted by the War Victims, Fund, most of the amputees and other disabled, are fairly young and will require multiple limbs, feet and braces over the course of their lives. Most of the amputees in Vietnam are now 30 to 50 years old. The average limb lasts three years and the average foot lasts only one year. This means that most of the amputees will require at least five prosthetic devices during the remainder of their lives and 20 to 40 feet.

Current annual production of prosthetic limbs is between 15,000 and 20,000, whereas the annual need may be 25,000 or 67,000. Annual production of feet is probably not much greater than limbs, compared to the larger annual need of 70,000 or perhaps 200,000 feet.

Estimates of need at the regional level served by the Centers do not clarify the scene. The Quy Nhon center serving provinces with a population of about 5 million estimates there are 100 new amputees in their region each month, or about 1200 per year. The Da Nang center serving provinces with a population of at least 5 million only sees ten new amputees each year. Although some difference between these numbers could be explained if most new amputees were handled by MOH hospitals rather than MOLISA centers, the difference is so large it defies comprehension.

The Da Nang Center seemed to be the most confident about their data on coverage of needs. The Director states that they have provided limbs to 80 percent of the war victims in their five provinces. Many of those not yet reached are in remote or relatively inaccessible areas, and include a high proportion of ethnic minorities. Nevertheless, while the team was at the Da Nang Center, a woman came in who had lost a leg during the war, at least twenty years ago. She was using crutches and had not previously had a prosthesis. She lived only 35 miles from Da Nang. She stated that she had been unable to afford a visit to the center.

### **C. Status of National Planning**

MOLISA has been steadily establishing a national system of Rehabilitation Centers and support capabilities. Each of the Centers has been or is about to be matched with an external donor. There are currently twelve facilities within the system, listed below in order from north to south:

Facility	Donor
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<b>1. Ba Vi Center</b>	<b>GTZ/Germany</b>
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Ba Vi is located about 70 kilometers north of Hanoi, a site chosen for its safety during the bombing of North Vietnam. It is a large facility, with technicians trained by Germany. Because it is somewhat isolated, the Center does not serve many amputees. Ba Vi specializes in above-knee prostheses, some referred by the Institute at Hanoi. Ba Vi also produces limb components, e.g., knees, feet, wooden stock for sockets, for other centers.

<b>2. Hanoi Rehab. Inst.</b>	<b>Prosthetic Research Foundation/U.S.</b>
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The prosthetics facility at the Hanoi Rehabilitation Institute began in 1984 as an in-take center for Ba Vi. It was used for measurement of patients and for training. It has become a Center for services and research, serving twelve provinces in the North. The outreach effort is active. The Institute is now the site for PRF's computer assisted design of stump sockets and assembly of PRF components. Most of the prostheses are below the knee.

<b>3. Haiphong Center</b>	<b>NORAD/Norway</b>
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The Haiphong Center is modern and large but produces very few limbs. The Center's funding from the government is limited. There is a small outreach effort.

**4. Tam Diep Center**                      **United Kingdom (proposed)**

This Center is located on the northern border of Thanh Hoa province, the same province as for the Thanh Hoa Center. After the expansion of the Thanh Hoa Center, Tam Diep's activities diminished. Assistance from the U.K. will help introduce prosthetics technology developed at Jaipur, India

**5. Thanh Hoa Center**      **World Vision/U.S.**

Previously a sub-center of Tam Diep, assistance from World Vision has helped a young and energetic staff develop a full scale production facility; however, there are no surgical facilities. Thanh Hoa Province has a population of 3 million; there are 600 villages. The Director reports that there are 6,000 disabled in the province. Of the 1,200 to 1,500 disabled seen each year, only 2 percent of the cases each year are new. Most of the amputees are in remote areas; outreach is important. Travel to the western mountains requires three days one-way; the distance is 300 kilometers. The eleven technicians' production is close to the annual target of 1500 prosthetic devices each year. In addition to limbs, the center produces some simple orthotic braces, crutches and repairs some of the 200 wheelchairs in the province.

**6. Vinh Center**                      **World Vision/U.S.**

The Vinh Center started in 1987 and has twenty-five technical and professional staff including a physician who performs orthopedic surgery and supporting medical staff. The center serves four provinces with a total population of about 5 million, of which .27 percent or 13,500 are estimated to be amputees, and .67 percent or 33,500 are paralyzed. About 1,300 prostheses had been produced in the first ten months of 1993, including 340 above-knee, 667 below-knee, 120 arms and 253 orthopaedic shoes; the target for the year is 1,800. About half the patients are farmers. Outreach teams of up to eight staff go out to districts once every four to six weeks for three to four days. In each area, one visit is required for measurement and one visit for delivering and fitting the devices. Trips are announced on TV and radio. A typical visit to a district reaches 50 to 80 patients: In 1993, 14 out of 500 districts had been reached. Visits to seven districts were planned for November and December. At this pace, perhaps 1100 patients could be served by outreach in a year.

**7. Da Nang Center**                      **World Vision/U.S.**

The Da Nang Center was built in 1967 and began operation in 1968. The five provinces served have a high proportion of amputees; the Director estimates 150,000 people are disabled in the population of 5 million. More than 15,000 are estimated to be amputees, of whom more than 80 percent are ex-military or war victims. The Rehabilitation Department includes surgical and physio-therapy services. Outreach is provided to three provinces and serves 50 percent of the patients. There is a full-time sub-center with three workers. USAID/World Vision funds permit the center to serve more amputees. The Director estimates that overall about 80 percent of the amputees have been served since 1975, including all former NVA

victims. The Center is now serving mainly civilian victims, as well as former ARVN veterans. More than 50 percent of those served have received at least two limbs; a prosthetic limb lasts for about three years. Only a small number, about ten, new amputees come to the center each year.

**8. *Quy Nhon Center*                      *World Vision/U.S.***

This center opened in 1967 with financial support from the Canadian government. After 1975 the center was integrated with an orthopaedic workshop assisted by the American Friends Service Committee (AFSC). The current center was built and equipped with AFSC funds. The AFSC support ended in 1990 and World Vision assistance began in late 1991. The center is responsible for six provinces with a total population of 5.5 million persons and an estimated amputee population of 24,000. There are an estimated 1,200 new cases each year requiring some type of prosthetic or orthotic treatment, including new cases of polio, especially among young children. Total staff of the center is 42 persons, including a 13 person staff of the orthopaedic workshop composed of nine limb makers, one brace and shoemaker, two leather workers and one mechanic. Five technicians were trained prior to 1975 by AFSC and eight received three-year training at the Ba Vi center with East German assistance. The thirteen person medical rehabilitation unit includes two physicians and five senior physical therapy technicians. Production with funds from World Vision began in October 1992. During the first eight months of 1993, the center produced 331 above-knee and 846 below-knee prostheses as well as braces, upper limbs, and shoes. The center delivers about 40 percent of all devices at the center, while 60 percent are provided through an outreach program to the villages. On each outreach trip, lasting up to one month, the team tries to deliver as many as 200 limbs to one to two districts in a single province.

**9. *Center for*                      *Terre des Hommes/Germany*  
*Rehabilitation of*  
*Paralyzed Children,*  
*Ho Chi Minh City***

This center opened in November 1983 with financial support from Terre des Hommes to serve the needs of disabled children, ages 5 to 15. About 60 percent of the children are polio victims, 30 percent cerebral palsy cases and 10 percent deformities. Patients receive surgery as required, health care, rehabilitation and education (both academic and vocational) during their average three to four month stay. Staff includes three technicians for braces who were trained at the ICRC Center and three technicians to make shoes. Braces are purchased from the Ba Vi Center and modified to fit each patient. Staff also includes eight physical therapists, including one physician, who were all trained at the Ho Chi Minh City medical complex. The center normally has 100 in-patient children in residence and about 30 out-patient children from the Ho Chi Minh city area. The center operates under the direction of MOLISA which pays staff salaries and operating costs of the center. Funds from Terre des Hommes covers food, medicine and medical treatment; this organization also provided funds for construction of the center. Beginning in 1991, Terre des Hommes began to reduce the level of its

assistance by 20 percent annually; although, it had not notified the center that it plans to terminate its assistance.

**10. Ho Chi Minh City International Committee  
Center for the Red Cross (ICRC)**

This center received assistance from the U.S. through the World Rehabilitation Fund, from the late 1960's to 1975, and from the ICRC in recent years. The current ICRC project began in 1989 and is reviewed and extended annually. ICRC is beginning to plan for project phase-out, which is likely to occur over the next two to three years. It is responsible for serving the estimated 12,000 amputees in 12 provinces of the south and Ho Chi Minh City. Amputee NVA veterans receive first priority and represent roughly half of all amputees in the provinces served. As a second priority, the center serves the ARVN veterans, young and working age amputees and people from rural areas. The staff includes 15 prosthetic/orthotic technicians of whom three are expatriates. The ICRC staff estimated the potential annual production capacity of 4,000 prostheses; however, current annual production is about 1,500 below-knee and 500 above-knee devices. The long term plan of MOLISA is to introduce the ICRC prosthesis to all ten rehabilitation centers as the best and most appropriate technology for Vietnam.

**11. Thu Duc Center Viet Nam Assistance for the Handicapped (VNAH)/U.S.**

The Thu Duc center was established in the 1960's as a vocational training center for handicapped veterans with U.S. support until 1975. Since 1975 it has continued as a vocational training center for the disabled with financial support from MOLISA. It is officially named the 2nd Central Vocational School for the Handicapped. This center is primarily a wheelchair production facility. It and the Ba Vi center are the only wheelchair production centers in Vietnam, with the Ba Vi center concentrating on production of hand-pedaled tricycles and the Thu Duc center on regular wheelchairs. Although the VNAH has plans to initiate prosthesis production at Thu Duc, only 500 prosthetic devices have been produced to date, mainly because of limited funding from VNAH. The principal estimated the need for wheelchairs in Vietnam at about 5,000 annually to serve an estimated 67-70,000 persons who could benefit from use of a wheelchair. Current production capacity at Thu Duc center is estimated at 3,000 annually; however, current annual production is about 1500. Wheelchair production is based on orders received from MOLISA, based on requests from all provinces, plus a small number ordered directly by persons who can afford to pay. The center plans to produce 4,500 prosthetic devices (1,500 above-knee and 3,000 below-knee) over the next two years with financial support from the VNAH. There are five prosthetic technicians at the center. Two of them were trained by the World Rehabilitation Fund prior to 1975; the other three are new and receive some on-the-job training from two trainers lent by the Can Tho center.

## **12. Can Tho Center**

**VNAH/U.S. (formerly in collaboration with World Rehabilitation Fund, WRF/U.S.)**

Construction of this center began in 1968, and it was opened in 1972 with WRF support. Prior to 1975 the center had a staff of 90; now it has 45 including 20 persons in the prosthetics workshop, 17 in the rehabilitation center and seven administrative and support staff. The Can Tho center is responsible for 8 provinces in the south of Vietnam with an estimated population of 10-15 million. The center's director estimates the disabled population at 20,000 including amputees, polio victims and others requiring services. He estimated that 80 percent of the amputations were war-related and 20 percent civilian accidents or medically indicated reasons. Prior to the recent USAID assistance through WRF and VNAH, the center produced 2,000 prosthetic and orthotic devices annually. With WRF/VNAH support production increased to 6,000 devices annually, but only with extensive and unsustainable overtime work. The director estimated the center's real capacity at 4,000 devices annually. Since 1975 the center has produced over 25,000 devices, including over 17,000 lower limbs, 441 upper limbs, nearly 2,500 braces and over 5,000 orthopaedic shoes. This is the main center in Vietnam providing prostheses to ARVN veterans.

Some specialization has emerged among the centers. As noted above, Ba Vi produces components (feet, knees, wood stocks for sockets) and mainly fits above-knee amputees; it is in an isolated location, limiting its usefulness as a center to serve amputees. The Hanoi Center at the Rehabilitation Institute is using a technically advanced system developed in Seattle, based on computer designed sockets and components fabricated in Seattle. Orthotics (bracing to compensate for weakened muscles) is practiced at the Polio Hospital and on a small scale at the Quy Nhon Center.

MOLISA's planning for this national system appears to be recent and not yet complete. A school for prosthetists and orthotists, to be located at the Institute in Hanoi, is now being planned with the Germans. This is a fundamental step towards providing competent staff for the future. Training in the past has been on an apprenticeship basis, by expatriate or Vietnamese skilled workers. The more skilled workers were trained in the fifties and sixties; they are now retiring, and there are scant capable replacements. Plans for the school, which include building a five-story structure with one-floor devoted to training 20 prosthetists in a three-year program, have stimulated thinking about projected staffing needs.

The broad range of technology currently in use provides natural experiments, for example testing the durability of different types of feet, and innovation, for example the use of ICRC's polypropylene technology at HCM City. With some planning, guidance and data collection, the experience emerging from the different centers would be a valuable resource for the national program.

### **D. Prospects for More Complete Information for National Management**

As the national system expands and becomes more complex, national planning becomes increasingly important. And planning requires more reliable and more comprehensive

information about the needs of disabled people, their geographic locations, the nature of their disabilities. There has been no national survey to determine the number of amputees and other disabled persons, nor to determine the number of those persons who have and have not received at least one limb through existing programs. The surveys undertaken to date have been limited to specific areas of the country and have lacked the scientific rigor required for an accurate and reliable survey. Some of the surveys have been carried out by MOLISA rather than by an organization with trained survey researchers and demographers.

German aid (GTZ) has offered to finance a comprehensive survey of the disabled population, in connection with their assistance to the Rehabilitation Institute in Hanoi. Dr. Huynh from the Institute is now planning the survey, with special attention to training surveyors to diagnose disabilities. The design of the survey and the analysis of the data will be complex; it is not certain that experienced surveyors will be involved. If the survey is well done it will answer many of the questions about the need for limbs, and it will provide a more certain basis for planning future needs for prosthetics and orthotics. The team's concern would be whether MOLISA has the technical staff required to develop the survey questionnaire, train the field staff, and analyze the results. Each of the donors has an interest in the quality of this information. Since the U.S. is assisting seven of the twelve service facilities, U.S. interest in the data should be keen.

In the meantime, there may be other existing data which have not been made available. The Provincial and District LISA offices compile tallies of disabled in their area; Center Directors tell us that they do not have this data. We are told that these tallies may not be reliable, because needs are probably overstated to justify higher levels of assistance. We are also told that MOLISA disburses annuities to disabled veterans; however, the rosters of annuitants have not been made available to the Rehabilitation Institute or the Centers. Since the GTZ survey results may not be available for at least a year, MOLISA should be encouraged to use data currently in their system. Of particular interest for USAID supported Centers would be information about disabled people in remote or inaccessible districts, civilians who had lower priority in the past, as well as southern provinces where former South Vietnam (ARVN) veterans may reside.

It would not be surprising if MOLISA were reluctant to release demographic information to the donors, fearing that the release of information may entail some release of MOLISA's power. Nevertheless, assistance from the donors can be more useful and appropriate if MOLISA and the donors share a common understanding of the problems and needs. Having accurate information is essential for the government and the donors to plan appropriate programs and to identify areas of highest need. The team considers this of great importance for development of future programs.

*Recommendation:* USAID/Bangkok should discuss this up-coming survey with MOLISA and GTZ officials to make sure the survey will provide the information USAID needs for its project planning and monitoring purposes. USAID may be able to get a short-term survey research expert to review the questionnaire through the Demographic and Health Surveys Project managed by USAID's Office of Population.

## **E. Remaining Questions**

More data is needed to answer the following questions about war victims in Vietnam with reasonable accuracy (+/- 15 percent):

- How many physically disabled people are there?
- Of these, how many require prostheses or orthotics?
- How old are they? (MOLISA states that there are many young amputees from the recent conflict with Kampuchea.)
- Where are they located, by district?
- In what category are they for determining priority of service?

At the moment, most of the answers to these questions are numbers with no better than +/- 50 percent accuracy. In other words, the information is far from adequate for sensible planning.

## **V. ASSESSMENT OF SERVICES TO WAR VICTIMS**

### **A. Summary Observations**

*1. Increased Production.* All the centers visited appear to be reaching production targets, and to be working close to full capacity with current staff, equipment and facilities. Since there have been little or no increases in these factors of production, virtually all the increase has resulted from: (a) adequate supplies of materials to use existing capacity, and (b) increased productivity. It is apparent that the centers have been pushing hard to boost production. World Vision and VNAH have provided financial incentives which appear to have been effective.

Total production by the centers in 1993 may approach 20,000 limbs, plus wheelchairs and other devices. The government plan projected only 12,000 limbs for this period, but now sees that production will be at least 16,000 to 18,000. Assuming limbs require replacement every three years, at full production perhaps 60,000 amputees could be helped. If the total number of amputees approaches the MOLISA estimates (200,000), replacement of limbs for those with easier access to the centers would almost absorb the total production. Unless there is a substantial increase in production, many amputees not yet served may never be served. On the other hand, if the total number of amputees is close to the World Vision low estimate (70,000), current production capacity is probably adequate, assuming good outreach to the war victims not yet reached.

Further increases in production would require more skilled workers and perhaps expansion of facilities (or conceivably, multiple shifts). Because there is a firm limit on MOLISA staff levels, the centers cannot hire additional staff. The labor constraint argues for consolidation of

the gains in production, without trying to push through the ceiling on production. MOLISA managers noted that some staff previously trained for prosthetics have left their positions for jobs in the private sector; the current need for skilled workers in the economy is pushing up wage levels in the marketplace. MOLISA seems concerned about becoming uncompetitive in the labor market and losing their better trained staff as the Vietnamese shift to a market economy. (Physicians were given the right to set up private practices in October 1993.)

The team offered suggestions for increasing production despite the labor constraint by contracting out components, preferably to the private sector. VNAH is already aggressively purchasing components and finished devices from within the national system of centers, and in the process outbidding other centers. The suggestion to contract with the private sector was dismissed, and only hesitantly discussed after more consideration of the labor constraint and the resulting ceiling on production.

**2. Trade-off costs due to production increases.** Perhaps because of the financial incentives, and certainly because there is a more steady supply of raw materials, the prosthetic technicians are working more hours and working more quickly. This achievement comes at the expense of quality in production and finishing. Since Mel Stills' visit in May 1993, he has seen a decline in the quality of finished prostheses.

Another trade-off may be reduction or no expansion in travel by prosthetists and technicians for the outreach to those amputees without access to the centers. The outreach effort is increasingly important as the needs of those who have easy access are met. Outreach requires at least two visits to communities by the Center's staff, diverting staff from production at the center. As travel time increases to reach remote and inaccessible areas, the loss of production time will increase. Or outreach will be sacrificed. This issue can only be productively dealt with through alert management and careful setting of priorities.

## **B. Need for Quality Control**

None of the Vietnamese staff at the centers, with the possible exception of the ICRC-assisted center in Ho Chi Minh City, would qualify as a Certified Prosthetist, as defined by the International Society for Prosthetics and Orthotics (ISPO). In the South, the skilled technicians at the centers were mainly trained before 1975 by the World Rehabilitation Fund. In the North, the trainers had been trained previously in the Eastern Bloc countries or in Russia. The technology transferred from the Soviet bloc is now very out of date, at least 25 years and perhaps 40 or 50 years old. Most of these skilled technicians are approaching retirement. When they leave, there will be few mid-level skilled technicians ready to move up. (The Director of the Da Nang Center stated that lack of training is a big problem; the younger workers don't have adequate skills to replace the retiring technicians. He wants in-country training from World Vision and ISPO; he intends to have all the technical staff learn English.) Vietnam faces a serious shortage of skilled technicians in the next few years, and needs to bring the whole level of technology forward at least one generation. Even if the prosthetics technology were updated, the level of orthopaedic medicine is so far behind current technology that benefits of improved prosthetics might be lost.

**1. Alignment of above-knee (AK) prostheses.** Throughout Vietnam, the team observed a consistent error in alignment of AK prostheses. All AK sockets lacked sufficient flexion as was demonstrated by excessive foot dorsi flexion at heel strike and prolonged time on the heel of the prosthetic foot. This may contribute to the excessive early deterioration of Vietnamese prosthetic feet. This misalignment causes gait deviations that will result in increased energy expenditure for the patient.

**2. Socket finish.** Sockets examined at different sites were tacky and fuzzy on the inside. This may be due to insufficient amounts of promoter being used during lamination. Insufficient use of promoter prolongs the prelamination process. It simply takes the plastic longer to harden, and if the socket is removed from the model early the inside will be fuzzy.

Breakage may be a problem in some centers as they are reinforcing the socket with wire or heavy cloth cord around the patella bar. A minimal amount of cloth is used and reinforcements, i.e., glass, nylon, carbon fiber, etc. are not available.

Prosthetics cosmesis is not appropriately addressed. Laminated limbs are all a very pink color that does not match Vietnamese skin tones. Contours of the prostheses do not closely match the anatomy, but function is not adversely affected.

**3. Socket fit/model modification.** Socket fit is basically a plug fit, with the patients improving comfort by padding up the socket.

Model modifications do not give consideration to measurements taken, residual limb contours, or remaining soft tissue density. Model modification consists primarily of a large build-up placed over the anterior plaster model. No evidence of reference measurements is observed. Model modification was impossible at one center which used concrete to fill the molds because plaster was not available. This method of model modification results in a plug fit with an excessive pressure build-up in primary weight bearing areas.

All patients demonstrate prolonged pressure with thickening of the skin and discoloration.

### **C. Ways to Improve Quality**

The issue of quality can only be addressed effectively by the on-going, routine educational process and supervision. Short training courses, such as the one conducted by members of this evaluation team at Da Nang and sponsored by World Vision, are of benefit, but the lessons learned must be reinforced on an ongoing basis.

The team suggests that future USAID grants to upgrade and increase production at the rehabilitation centers consider employment of qualified prosthetists/orthotists who would be involved clinically at least 90 percent of their time on site. The effective ICRC project and the proposed GTZ project provide the daily involvement of qualified prosthetist-orthotist practitioners. At present, a Vietnamese clinically qualified prosthetist-orthotist cannot be identified. Among the USAID grantees, only World Vision employs an American C.P.O., who

is primarily involved in management and has little time to provide clinical input to the four World Vision sites. ICRC provides three CPOs for their single site in Ho Chi Minh city.

**1. Mission statement by MOLISA.** The team recommended to Mr. Tue that MOLISA issue a clear statement of objectives for the prosthetics program, conveying a standard a quality for production and service to clients to be applied throughout MOLISA's system of rehabilitation centers. Mr. Tue stated that he could and would do so.

*Recommendation:* USAID/Bangkok should follow-up with Mr. Tue to determine whether a policy statement on quality standards has been issued. The policy should guide efforts within each USAID-assisted program to encourage quality work.

**2. Supervision to balance quantity and quality.** Quality standards need to be applied every day throughout the Centers and workshops. The most important ingredient for instilling and sustaining quality standards for work is a high standard of performance among the workers. Effective and constructive supervision can clarify what the standard means and can encourage performance to meet the standard.

MOLISA needs a national level supervisor/expert to routinely make (unannounced ?) visits to centers. This expert should spend time in the U.S. or equivalent (Australia; Kobe, Japan) centers to be introduced to quality standards.

MOLISA needs to develop a group of prosthetic supervisors. These supervisors need to be top prosthetic practitioners, who recognize and support quality, and who can problem-solve for their staffs. They would be responsible for pursuing any quality problems noted by the MOLISA expert. Ideally, these supervisors would be so effective in maintaining local level quality that the MOLISA expert would become only a final system-wide check. The mid- and senior level technicians and Center managers require training to acquire good supervision skills.

The philosophy of quality should permeate down to staff from the supervisory group described above. In time (3 to 5 years), the new generation of prosthetists would all expect quality performance of themselves and their colleagues.

*Recommendation:* USAID/Bangkok, in consultation with Allen Randlov, should offer to provide a workshop, perhaps two weeks in duration, to teach supervision skills to managers and senior and some mid-level technicians throughout the system of Centers. USAID/Bangkok should discuss with MOLISA and other donors the best way to create a national-level supervisory system. The workshop could be offered on the condition that there is a plan for a supervision system.

**3. Need to improve safety for workers.** Each of the centers needs to eliminate safety risks for workers. In many centers, dangerous equipment is not adequately shrouded or protected to avoid injuries to workers. Ventilation is inadequate in areas where use of chemicals produces toxic fumes. The main responsibility for eliminating any safety risks lies with the individual

centers. MOLISA and the grantees should follow-up to ensure that the necessary actions are taken.

*Recommendation:* Each of the centers should take immediate action to eliminate safety risks to workers.

**4. Regular follow-up spot-checks: client feedback.** Some of the best information about the effectiveness of the prosthetics program will come from previous clients, who can express their satisfactions and complaints. There are no marketplace decisions (purchases) by patients that over time can express the levels of satisfaction with the Centers' services. MOLISA should seek proxy methods of learning what has been successful and what about their services needs improvement.

For example, rehabilitation center staff could set aside time, perhaps on outreach trips, to routinely and systematically follow-up with a sampling of amputees: six months, eighteen months and three years after they have received prostheses. The Institute in Hanoi could devise a short questionnaire to document these follow-up interviews.

*Recommendation:* World Vision staff work with Institute staff to devise a simple, short questionnaire for a routine sampling of satisfaction levels of previous recipients of prostheses. The questionnaire, the sampling method, and the scheduling of interviews as a routine could be pilot-tested at the Da Nang Rehabilitation Center.

**5. Promotion of Professional Standards for Prosthetists-Orthotists.** Current professional standards are being addressed on a national level in Vietnam. We were informed that a Board had been created that tests P&O applicants wishing to advance from one technical grade to another. We did not see this examination nor did we receive details of the procedure or content of the examination. The development of a national association with annual meetings could promote an exchange of information and at least identify potential leadership.

#### **D. Assessment of Durability and Function**

MOLISA, perhaps through the Institute for Training and Research should utilize their own existing statistics--within centers and between centers--to assess durability and function of prosthetic devices manufactured at the MOLISA centers. The needs of groups such as farmers should be given special attention. The variety of materials and production processes within the system provides opportunity to assess and to compare available materials, for example: limbs made from polyester, poly-propylene, aluminum and wood can be compared for durability, function and cost. Locally available materials should be used to the greatest extent possible given standards for durability, function and cost.

Prosthetic feet should be given urgent attention; it is clear that the durability of prosthetic feet is a major problem in Vietnam. A trained prosthetist and an engineer could easily identify this problem and develop a solution in a short period of time. Mel Stills believes this is primarily a materials problem, but a change in prosthetic design may also improve longevity. Current

foot manufacturing techniques need a thorough review by experts qualified in prosthetic foot production.

*Recommendation:* PRF should move deliberately over the period of their current grant to shift to local production in Vietnam of all prosthetic components. In the future, the Institute for Training and Research should consider developing the capability for testing materials and devices. PRF or other organizations working on appropriate prosthetic technology should consider developing with the Institute a joint proposal to donors for improving capabilities for testing.

*Recommendation:* USAID/Bangkok should discuss with the Institute for Training and Research the need for experts to assess the durability of prosthetic feet and to make recommendations for increasing the durability of feet at reasonable cost and within the production capabilities in Vietnam. A request for technical assistance could be submitted to Allen Randlov, manager of the War Victims' Fund.

#### **E. Ways to Improve Component Durability and Function**

Even without improvements in testing capabilities, it is possible to improve technology within the system of centers by improving communications and facilitating transfers of technology among centers. Qualified prosthetists-orthotists working in clinical situations could easily identify component design flaws that affect durability and function. Without this component, durability and function issues cannot be addressed. The team suggests that MOLISA organize semi-annual meetings of all centers with the purposes of discussing common problems and of exchanging experience with solutions.

The Institute for Training and Research should encourage experimentation among centers. When technology problems cannot be solved within the system, the Institute should take the lead in requesting outside assistance. The Institute can request external assistance for product development, for example, for improved materials and designs for feet. When a superior product is developed, the Institute should consider standardizing the product or procedure throughout the system.

#### **F. Needs for Orthotics**

The team was not able to give careful consideration to needs among war victims for orthotics. There is a tremendous need for orthotic services in Vietnam. The team has the impression that polio victims, due to failures in the immunization system during and after the military conflicts in the country, are a significant portion of the disabled population. Lower extremity orthotics is addressed by using conventional aluminum uprights, metal bands and leather coverings.

Skills required for successful orthotics are high in comparison with prosthetics. There are a limited number of trained technicians to produce lower limb orthotics. Most of the centers in the system are not ready to provide orthotics services. There is no training program to

produce more orthotic technicians. Each facility visited employed only one orthotic technician, and the directors of the centers were worried that if anything happened to the orthotic technician, they had no one to replace him.

The introduction of thermoplastics will be needed for orthotics production; there was no evidence of thermoplastics use. Other areas of orthotics which would need to be developed include spinal, upper extremity, wheelchair seating, and specialty areas of the lower extremity orthoses, i.e., club foot bracing and correction, congenital dislocated hip positioning devices, and fracture bracing.

The Institute for Training and Research should assess the needs for orthoses as part of the planned survey of the population. On the basis of this information, a plan for orthotics production and fitting, physical therapy and follow-up of orthotics users could be developed. The plan might provide for a pilot effort at one or two centers, as the source of experience and training of orthotics experts and technicians. The Quy Nhon center and the polio hospital in Ho Chi Minh City are candidates for such a pilot effort.

### **G. Needs in Areas of Orthopaedics Surgery**

Because most war-time injuries requiring orthopaedic surgery were treated long ago, the need to improve orthopaedic technology is relatively low. The main concern of the team was that some surgical practices, including some recently acquired new procedures as well as some basic procedures, are not being used properly. As a result, there is risk that orthopaedic surgery may harm rather than help patients.

The point of view of the orthopaedic surgeon on the team is that the most pressing problem at this time in orthopaedic surgery in terms of education is to reinforce fundamental orthopaedic principles. For example, HVO should consider a course or courses on the principles of fracture management which would include non-operative and operative care, appropriate for conditions in Vietnam. Additional orthopaedic education for the management of common orthopaedic problems such as developmental dysplasia of the hip, club foot, polio and pediatric fractures would go a long way to reducing some of the problems observed by the team.

Part of the underlying problem in improving patient care is related to the lack of technology in Vietnam. Even the larger hospitals may lack important equipment such as simple diathermy machines for intraoperative coagulation of blood vessels. Surgical instruments for some of the most basic operative procedures were lacking at clinical sites visited. High-tech surgical equipment is not needed, has low priority, at this time, compared to the pressing needs to improve some of the most basic medical care in the country.

## **H. Outreach of Services for War Victims**

**1. MOLISA plans for organizing support.** The Minister of LISA has asked Dr. Huynh at the Institute for Training and Research to help mobilize organizations which can support the national prosthetics program. The Institute's plan is to have three kinds of organization:

- A national organization of amputees and perhaps other groups of disabled people to represent the views of the disabled. Such an organization would be able to give information to the government about the needs of their members, to educate the membership about their disabilities and about services available to them, and to stimulate the members to work together as a group to help themselves.
- An organization of people, institutions, companies that want to improve the lives of amputees and perhaps other groups of disabled. This kind of organization could raise funds, educate the public, mobilize support services such as job training or job placement.
- A professional society for orthotists and prosthetists. This group could establish and promote the work standards needed to improve steadily the quality of production in the system.

**2. Current outreach by the Centers.** Until a reliable survey identifying the numbers and location of war victims, especially amputees, it will be difficult to plan an outreach program to reach all war victims needing assistance. Information from the Centers given above indicates that perhaps 50 percent to 80 percent of war victim amputees have been reached. Outreach efforts, however, do not appear to be reaching remote areas. It is possible that there are significant numbers of war victims in remote or difficult to reach areas that have never been helped by the rehabilitation centers. It may be beyond the capacity of the current system of centers to reach these groups. While awaiting better data about the disabled, experiments with different outreach methods could be undertaken. Designing an effective outreach system requires understanding the trade-offs involved; for example, when prosthetists are on outreach trips, they are not producing devices; the objectives of increasing production and providing more outreach are somewhat in conflict. Would mobile production units that don't have to make two trips, one for measurement and one for delivery, be more effective? Could the Ministry of Health infrastructure be mobilized to reach amputees, for example, through the Community Based Rehabilitation system?

**3. Community Based Rehabilitation.** If there are substantial numbers of amputees beyond the foreseeable reach of the network of rehabilitation centers, the Community Based Rehabilitation system may provide an alternative service system. The CBR program began in Vietnam in 1992, using the WHO-endorsed model and materials pioneered by Dr. David Werner in Mexico. The National Coordinator, Dr. Hai, has translated and produced a full set of instructional manuals for use by community workers and families. At the community level, MOH staff coordinate with community leaders, usually the Chairman of the Peoples' Committee. The emphasis of the program is on basic education to foster support for the disabled, and on practical knowledge to enable actions within the normal capabilities of

families and communities. Based on a visit to a community near Hanoi, the CBR program can be operationally successful when there is leadership from motivated and competent health workers and community leaders.

*Recommendation:* USAID/Bangkok and the Office of Health should seek to learn more about how goals and incentives for outreach might be encouraged through the grantees' programs. The grantees might be asked to propose pilot activities to test more effective outreach schemes, perhaps leading to funding when grants are extended. Since World Vision is also working with Community Based Rehabilitation in the Da Nang area, pilot activities could include CBR involvement at the community level.

## **VI. PROGRAM MANAGEMENT**

### **A. System-wide Management by MOLISA**

Within MOLISA, the assignment of responsibilities for supervision and management is not fully apparent. Mr. Tue and the staff dealing with donors appears to control enough of the funding to be able to direct action by the centers. Recurrent funding from MOLISA's regular budget seems to be requested by the National Institute in Hanoi; leadership by the Institute seems to be in the hands of Dr. Huynh. During the evaluation, Dr. Huynh was very actively giving guidance and direction to the Directors of the centers. The Institute is increasing its role in training, with planned aid from the Germans, and will be responsible for the survey of disabled. The Institute may be the best organization to produce a national training plan for the system. Unfortunately, there was no evidence of a working relationship between Mr. Tue and Dr. Huynh. Dr. Huynh was not invited to participate in the evaluation team's briefing and discussions with Mr. Tue.

### **B. Training Strategy**

*1. Training for Prosthetics.* Much of the training of currently practicing prosthetists and orthotists was completed prior to 1975. There has been little up-grading of their technical skills in the years since 1975 although there have been revolutionary changes in the field of prosthetics and orthotics, particularly in the materials used for devices.

The team noted that many of the technicians at the centers visited demonstrated excellent skills in the basics of prosthetics and orthotics. However, their technology is a generation or two behind that of the western countries. Bringing these technicians up to a higher level of technical skills and providing them with more modern materials and equipment could not only increase productivity but also improve the quality of the product for the consumers, leading to longer usage and a longer-term reduction in costs.

MOLISA does not have a training strategy and could benefit from a carefully developed plan. It is possible that the support from the German development agency (GTZ) may help to develop such a plan which would be useful for all the donors and grantees.

The team noted three specific areas where training could be of immediate help in improving quality: socket finishing; model modifications, especially to edges and the inner side; better alignment. The training funds within the existing grants might concentrate on these areas. ISPO maintains contacts with technical experts in all areas of prosthetics and orthotics and could provide names of consultants.

There is a great lack of training materials in the Vietnamese language. World Vision has some older materials, and its staff is now reviewing the materials to ascertain their suitability for current training. As part of the development of a national training plan there should be a training curriculum agreed to by all the players so that there is more uniformity in training content. Although some centers are trying to improve the English reading capabilities of their technical staff members, this is not a good substitute for development of materials in Vietnamese which can be used by a much wider audience with a high level of comprehension. The training plan should cover the following areas:

- Pre-service education, including curriculum development: German (GTZ) assistance
- Inventory of skill levels of present staff.
- In-service training, including:
  - apprentice training in the system, and
  - short-courses to upgrade skills, based on clear guidelines about appropriate technology,

*Recommendation:* USAID/Bangkok, and Allen Randlov of the USAID Office of Health in Washington, should make contact with GTZ officials to determine what role that organization is willing to play in assisting MOLISA in developing a national training plan. If necessary, USAID/Bangkok should consider making funds available to assist in developing a national training plan, either through one or more of the current grants or separately. The technical assistance might be in the form of short-term visits by training and curriculum experts.

**2. Training for Orthopaedic Surgeons.** Training of orthopaedic surgeons is provided by both the Ministry of Health and MOLISA. The management issue here is to make sure the material taught in courses is appropriate to the level surgical technology that is possible to carry out in Vietnam. In Da Nang, Dr. Gottschalk taught surgical techniques to surgeons from the MOLISA Centers. He also performed a surgery at the Da Nang Center. Basic problems of hygiene, lack of or inappropriate equipment for diagnosis and for surgical procedures, and risk of post-operative infection prohibit most complex surgeries, such as spinal cord surgeries. The restriction to simple surgical procedures raises questions about short courses, lectures and training arranged by donors which deal with high-level surgical technologies.

Leadership is needed among the surgeons in the MOLISA system to direct, in a steady and determined way, the upgrading of basic skills and procedures. Dr. Gottschalk is prepared to explore low-cost residency training for perhaps three of the leading surgeons in the system. It

may be possible at the University of Texas to arrange a residency program, of perhaps four months duration. Additional funding would be required for travel.

*Recommendation:* Allen Randlov should discuss with USAID/Bangkok the desirability of residency training for surgeons outside Vietnam. If there is interest, possibilities for financing and arrangements should be explored with the University of Texas. If financing can be arranged, the University and USAID should issue invitations to named candidates through MOLISA.

MOLISA and NEED International are sponsoring a "Second International Orthopaedic Rehabilitation Symposium, United States/Vietnam" in Hanoi during November 1993. Spinal disorders and surgery will occupy one day of the symposium. It is not clear whether MOLISA and NEED International have carefully considered the appropriateness of their symposium topics for application in Vietnam at this time. There may be surgeons attending from other countries, including India and Thailand, where a higher level of technology is applicable. Nevertheless, the importance for current application in Vietnam should be a screening criterion for such events. In this case, there is no U.S. Government money involved, so the team is not raising this matter as an issue for our report.

The USAID-funded Health Volunteers Overseas is getting their program underway. After a slow start-up, HVO and the MOH sponsored their first workshops, on lower extremity trauma, in Hanoi and Ho Chi Minh City, one week each. The MOH didn't invite many surgeons, most participants were working in longer-term care. In the future, HVO wants to include more physiatrists. HVO's tentative workshop schedule for the end of 1993 and for 1994 includes Pediatrics/Cerebral Palsy in December, Spinal Injury in March, Amputations in May, Brain Injury/Stroke in September, and Rheumatology in December 1994. Another course being considered for early 1994 will feature emergency care, Advanced Trauma Life Support. A course on Accident Prevention is also being considered. HVO will request a no-cost extension beyond the current grant expiration at the end of May 1994. As HVO proceeds with this schedule, they should consider carefully with the MOH the appropriateness of the course material for Vietnam conditions.

*Recommendation:* HVO in consultation with USAID and the Ministry of Health should develop guidelines for determining levels of training appropriate to current levels of technology in Vietnam. These guidelines should also be made available to organizations such as NEED.

### **C. Coordination: Among Centers, Among Donors and Among Ministries**

*1. Among Centers.* As noted in section V.E.1. above, staff of the grantees and the rehabilitation centers indicated that there was little information exchange among them. Each grantee works with different rehabilitation centers operated by MOLISA which produce different varieties of prosthetic devices. The staff seldom receive information on what the others are doing or are planning to do in the future. During the course of the team's visits, its

members learned of training courses, workshops, or new plans and programs that would be of use to other grantees and the various MOLISA rehabilitation centers.

The team noted substantial differences in quality of the prosthetic products; yet there is no current mechanism for sharing information about the real-life experience with each device. The short useful life of feet was raised at every center, yet some models appear to last longer than others. The same appeared to be true with the various limbs produced by the different centers. The staff at all centers could gain from regularly scheduled meetings to discuss products, programs and future plans.

*Recommendation:* The team suggests that MOLISA and the Centers sponsor regular meetings/workshops to bring together the managers and the professional staff of the centers throughout the system, perhaps semi-annually. These gatherings may also serve as opportunities for training. These gatherings hopefully may contribute as well to a stronger sense of professionalism and to inculcation of quality standards. The team believes these workshops will be cost-effective; for participants from the centers assisted by USAID, funding from the grants should be made available.

**2. Among Ministries.** While MOLISA is responsible for care of invalids, the Ministry of Health is apparently developing some prosthetics and orthotics capability to meet the needs of its orthopaedic surgery centers. From what the team could ascertain, there is little coordination between these two ministries. Over the long term, orthopaedic surgery should be carried out within the Ministry of Health system to avoid wasteful duplication by the two Ministries. In the future, it may make sense to have the MOH take responsibility for the centers, on the premise that the MOH has more extensive coverage of the population. In the short to medium term, MOLISA's strong role in prosthetics may make this issue moot.

**3. Among donors and MOLISA.** The linkage of centers with donors is almost complete for the entire system of centers. Assistance from donors will be more effective if approaches to strengthening individual centers are consistent throughout the system. MOLISA should encourage exchange of information among donors and should provide standard guidelines to the donors. The donors should also make independent efforts to exchange information. This coordination might be facilitated if MOLISA convened periodic meetings with the donors as a group.

*Recommendation:* USAID/Bangkok should informally contact other donors and begin sharing information about programs for the centers. MOLISA should be encouraged to facilitate coordination among donors.

#### **D. Financial Incentives and Productivity**

Financial incentives for production provided by World Vision and VNAH have been effective in increasing production towards targets. As the production levels approach the capacity of centers, continuation of the incentives should be linked to gradual improvements in quality, according to standards established by MOLISA.

The evaluation team was unable to judge the quality of services at the Can Tho center assisted by VNAH because there were no amputees being fitted with prostheses when the team was present. The same difficulty occurred when Mel Stills and Susan Palmer visited the Can Tho center last March. The team believes the lack of a VNAH representative resident at Can Tho, or the very limited delegation of authority to the current director of the center, is detrimental to the center's efforts to serve clients. The practice of holding prostheses for delivery to a large group of amputees disrupts the flow of work at the center and undermines the ability to give adequate attention to each amputee. The push for higher production and for publicity seems to be taking precedence over service to the amputees.

*Recommendation:* The team recommends that VNAH delegate more responsibility to the Center Director to deliver prostheses on a regular basis; VNAH should find other ways to publicize its activities, instead of the group delivery.

## **VII. ROLE OF USAID**

### **A. Methods of Procurement and Payment**

The three current grants have far different requirements for the procurement of prosthetics and orthotics. The prices they are allowed to pay are different. The result is competition among grantees for the limited number of limbs and feet available. For example, the VNAH is authorized to pay a flat fee of \$35 per limb (formerly \$30) and \$150 per wheelchair. The VNAH purchases the prosthetic devices from the Can Tho rehabilitation center and wheelchairs from the Thu Duc rehabilitation center. Under the new agreement, VNAH will also be able to purchase prosthetic and orthotic devices from the Thu Duc center once it begins production. In addition, VNAH has made special purchases of prosthetic devices from other rehabilitation centers when its needs cannot be met by the Can Tho center. This is a simple system requiring simple accounting. VNAH orders the devices, takes delivery, pays the bill, and submits it to USAID for reimbursement. There is a clear record of what has been purchased.

On the other hand, World Vision is reimbursed for components. This complex system requires far more bookkeeping and accounting and far more records. World Vision ends up paying approximately \$27 per limb. Because it pays a higher price, VNAH has outbid World Vision for limbs, speeding up limb delivery to patients by VNAH while slowing down the same programs of World Vision.

This is a problem for USAID/Bangkok to resolve with the grantees and the production centers. It seems far better for all grantees to purchase similar prosthetic devices for the same price with the least amount of accounting difficulty. There is one important advantage the team could see for USAID in utilizing the more complicated World Vision system compared to the simple unit price system used under the VNAH grant. The cost reimbursement system avoids the problem in determining the value of the devices procured by VNAH, because there is no marketplace competition to determine price.

*Recommendation:* USAID/Bangkok should review the current payment arrangements for World Vision and VNAH in order to define a single suitable system for use with all grantees participating in the Vietnam war victims' program.

#### **B. U.S. Legislative Restrictions**

Health Volunteers Overseas is required to obtain licenses from USG Agencies. The Treasury Department has provided a license to transfer funds to Vietnam. The Commerce Department has not issued a license to permit shipment to Vietnam of medical instruments and equipment needed for HVO's program. Commerce is not persuaded that the War Victims legislation's "notwithstanding clause" allows the shipments. The issue has been referred to the General Counsel's office at Commerce. HVO has little leverage on the Commerce Department on a matter that may delay or diminish achievement of program objectives. If HVO wishes, USAID should be prepared to weigh in on such a matter with other USG Agencies.

#### **C. Measurement of Grantee Contributions**

Each USAID grantee is required to provide a matching contribution of at least 25 percent of the total project cost. The project proposals from each organization briefly describe how they will use the USAID funds and their own contribution. The proposed project budgets similarly detail USAID and grantee contributions. Periodic financial reports indicate the expenditures from both USAID and grantee contributions.

The team had some difficulty in trying to identify the grantee contributions during its site visits. This was especially true for the VNAH project. From what the team could observe, remodeling costs, equipment, supplies, training, and technical assistance costs were all covered by the USAID funds. The specific contributions of VNAH were not evident. The status of World Vision's contributions is clearly reported; they have been slow about disbursing their matching funds. We understand World Vision has a plan to rectify this problem. Matching contributions for PRF and HVO need to be checked through their headquarters.

#### **D. Effectiveness of the Management Structure**

The primary management responsibility within USAID for the Vietnam war victims program rests with the Regional USAID Mission in Bangkok. The program is being managed without daily access to the officials at MOLISA or easy contact with the grantees in Vietnam. Two of the grantees, PRF and VNAH do not have their responsible manager in Vietnam: PRF manages the grant from their headquarters in Seattle; VNAH is managed by Mr. Ca, who makes regular visits to Vietnam from his home-base in Virginia.

The main responsibility for monitoring the grants has been assigned to a bright and determined Personal Services Contractor, Ms. Susan Palmer, who works at USAID/Bangkok. She is doing a very good job of coordinating information and handling logistics for consultant teams. The grantees and the consultants have confidence in her effectiveness. Because this is

her first job of this kind overseas, she is learning as she proceeds; during the past year and a half she has developed a good sense of her responsibilities and many of the potential problems that USAID needs to know about. Her only handicap is lack of experience. For example, she has never attended an USAID course for project managers. Considering the complexity and size of the program, the long distance management, the political and organizational muscle of the grantees, and the senior level of management at MOLISA, USAID has substantial risk which warrants senior level attention and judgment. The main missing ingredient is more active supervision by a senior USAID officer; someone who can visit Vietnam more frequently with her, in order to assist her in assessing facts, in formulating judgments, in defining appropriate actions for USAID, and from time-to-time adding some institutional momentum to her recommendations and instructions to grantees. To ensure that the program manager in Washington is part of the deliberations, Allen Randlov should regularly arrange a conference call with Ms. Palmer and her supervisor, perhaps quarterly. The program is too complex to handle only through faxes or written documents.

*Recommendation:* On the part of USAID/Bangkok, senior Mission officers should make regular, routine visits to Vietnam for program monitoring and especially to reinforce the programmatic and management guidance provided to grantees by the able PSC employed by the Mission to manage this entire program. The War Victims' Fund program manager at the Office of Health should be in regular contact with a senior USAID/Bangkok Mission officer to supplement the more frequent contact with the PSC program manager.

## **VIII. RECOMMENDATIONS**

### **A. For MOLISA**

*Recommendation:* The team suggests that MOLISA and the Centers sponsor regular meetings/workshops to bring together the managers and the professional staff of the centers throughout the system, perhaps semi-annually. These gatherings may also serve as opportunities for training. These gatherings hopefully may contribute as well to a stronger sense of professionalism and to inculcation of quality standards. The team believes these workshops will be cost-effective; for participants from the centers assisted by USAID, funding from the grants should be made available.

### **B. For the Centers**

*Recommendation:* Each of the centers should take immediate action to eliminate safety risks to workers.

### **C. For World Vision.**

*Recommendation:* World Vision staff should work with Institute staff to devise a simple, short questionnaire for a routine sampling of satisfaction levels of previous recipients of prostheses. The questionnaire, the sampling method, and the scheduling of interviews as a routine could be pilot-tested at the Da Nang Rehabilitation Center.

#### **D. For the Prosthetics Research Foundation**

*Recommendation:* PRF should move deliberately over the period of their current grant to shift to local production in Vietnam of all prosthetic components. In the future, the Institute for Training and Research should consider developing the capability for testing materials and devices. PRF or other organizations working on appropriate prosthetic technology should consider developing with the Institute a joint proposal to donors for improving capabilities for testing.

#### **E. For Viet Nam Assistance for the Handicapped.**

*Recommendation:* The team recommends that VNAH delegate more responsibility to the Center Director to deliver prostheses on a regular basis; VNAH should find other ways to publicize its activities, instead of the group delivery.

#### **F. For Health Volunteers Overseas**

*Recommendation:* HVO in consultation with USAID and the Ministry of Health should develop guidelines for determining levels of training appropriate to current levels of technology in Vietnam. These guidelines should also be made available to organizations such as NEED.

#### **G. For USAID in Thailand**

*Recommendation:* USAID/Bangkok should discuss this up-coming survey with MOLISA and GTZ officials to make sure the survey will provide the information USAID needs for its project planning and monitoring purposes. USAID may be able to get a short-term survey research expert to review the questionnaire through the Demographic and Health Surveys Project managed by USAID's Office of Population.

*Recommendation:* USAID/Bangkok, in consultation with Allen Randlov, should offer to provide a workshop, perhaps two weeks in duration, to teach supervision skills to managers and senior and some mid-level technicians throughout the system of Centers. USAID/Bangkok should discuss with MOLISA, and other donors the best way to create a national-level supervisory system. The workshop could be offered on the condition that there is a plan for a supervision system.

*Recommendation:* USAID/Bangkok should discuss with the Institute for Training and Research the need for experts to assess the durability of prosthetic feet and to make recommendations for increasing the durability of feet at reasonable cost and within the production capabilities in Vietnam. A request for technical assistance could be submitted to Allen Randlov, manager of the War Victims' Fund.

*Recommendation:* USAID/Bangkok, and Allen Randlov of the USAID Office of Health in Washington, should make contact with GTZ officials to determine what role that organization

is willing to play in assisting MOLISA in developing a national training plan. If necessary, USAID/Bangkok should consider making funds available to assist in developing a national training plan, either through one or more of the current grants or separately. The technical assistance might be in the form of short-term visits by training and curriculum experts.

*Recommendation:* USAID/Bangkok and the Office of Health should seek to learn more about how goals and incentives for outreach might be encouraged through the grantees' programs. The grantees might be asked to propose pilot activities to test more effective outreach schemes, perhaps leading to funding when grants are extended. Since World Vision is also working with Community Based Rehabilitation in the Da Nang area, pilot activities could include CBR involvement at the community level.

*Recommendation:* USAID/Bangkok should review the current payment arrangements for World Vision and VNAH in order to define a single suitable system for use with all grantees participating in the Vietnam war victims' program.

*Recommendation:* USAID/Bangkok should informally contact other donors and begin sharing information about programs for the centers. MOLISA should be encouraged to facilitate coordination among donors.

*Recommendation:* On the part of USAID/Bangkok, senior Mission officers should make regular, routine visits to Vietnam for program monitoring and especially to reinforce the programmatic and management guidance provided to grantees by the able PSC employed by the Mission to manage this entire program. The War Victims' Fund program manager at the Office of Health should be in regular contact with a senior USAID/Bangkok Mission officer to supplement the more frequent contact with the PSC program manager.

#### **H. For USAID/Washington, Office of Health**

*Recommendation:* Allen Randlov should discuss with USAID/Bangkok the desirability of residency training for surgeons outside Vietnam. If there is interest, possibilities for financing and arrangements should be explored with the University of Texas. If financing can be arranged, the University and USAID should issue invitations to named candidates through MOLISA.

**APPENDICES**

**APPENDIX A: ITINERARY AND LIST OF CONTACTS**

October 25, 1993 - Hanoi

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**Orthopaedic and Rehabilitation Institute, MOLISA**

**Deputy Director: Prof. Bui Chu Hoanh, M.D.(Orthopaedics Surgery)  
Vice-President of the Vietnam Rehabilitation Association**

**Site of Prosthetics Research Foundation (Seattle) Project**

**Health Volunteers Overseas**

**Project Coordinator: Theresa Egan  
Project Assistant: Nguyen Thi Minh Chau**

**Community Based Rehabilitation, Institute for Protection of Children's Health (IPCH), MOH**

**Coordinator: Dr. Tran Trong Hai, M.D., Head of the Rehabilitation Department, General Secretary of Vietnam Rehabilitation Association**

**Expert in Rehabilitation, MOH: Dr. Pham Quang Lung, Vice-President of Rehabilitation Association Vietnam (VINAREHA)**

October 26, 1993 -Thanh Hoa

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**Thanh Hoa Rehabilitation Center, DOLISA**

**Director: Mr. Xuyen**

**Thanh Hoa General Hospital**

## 2. List of Contacts

### U.S. Agency for International Development

Mr. Allen Randlov, project manager, War Victims' Fund

Ms. Susan Palmer, PVO grants manager, Bangkok

Mr. Denny Robertson, General Development Officer, Bangkok

Mr. Eugene Morris, Deputy Director, Bangkok

### Ministry of Labor, Invalids and Social Affairs

Mr. Nghien Xuan Tue, deputy director, Department of International Relations

Dr. Bui Chu Hoanh, deputy director, Orthopedic and Rehabilitation Institute

Dr. Tran Danh Huynh, Orthopaedic and Rehabilitation Institute

Mr. Nguyen Manh Cuong, coordinator, Humanitarian NGOs Projects, Department of International Relations

### Ministry of Health

Dr. Tran Trong Hai, head of Rehabilitation Department and national coordinator, Community Based Rehabilitation and HVO advisory group member

Dr. Pham Quang Lung, Rehabilitation Expert and HVO advisory group member

### Thu Duc Rehabilitation Center

Mr. Truong Van Quoi, principal

Mr. Tran Van Ca, president, VNAH

### International Committee for the Red Cross (Ho Chi Minh City)

Dr. Do Anh Nha, director

Dr. Tran Van Tan, deputy director

Mr. Bernard Matagne, prosthetist/orthotist

### Can Tho Rehabilitation Center

Mr. Hung, director

### Center for Rehabilitation of Paralyzed Children (Ho Chi Minh City)

Dr. (Mrs.) Nguyen Thi Hong Na, director

### Quy Nhon Rehabilitation Center

Mr. Cuc, director

Dr. Cuong, medical doctor

### Da Nang Rehabilitation Center

Dr. Huang, director

Mr. Nga, vice-director

### Vinh Rehabilitation Center

Mr. Nguyen Van Giai, director

Thanh Hoa General Hospital  
Dr. Le Ba Hung, director

Thanh Hoa Rehabilitation Center  
Director

World Vision  
Mr. Daniel Watkins, CPO, Da Nang  
Mr. David Trees, Administrator, Hanoi  
Mr. David Chandler, Bangkok

Health Volunteers Overseas  
Ms. Theresa Egan, project coordinator, Hanoi

VNAH  
Mr. Tran Van Ca, President

**APPENDIX B: ORGANIZATION CHART FOR THE NATIONAL PROGRAM**



**APPENDIX C: CONTRIBUTION FROM DONORS FOR PROSTHETICS  
AND ORTHOTICS ACTIVITIES**

**A. United States - Agency for International Development**

**1. Prosthetics Research Foundation**

Phase I (9/91 to 9/92) - \$ 275,000

Phase II (9/93 to 9/95) - \$ 500,000

**2. World Rehabilitation Foundation/Vietnam Assistance to the Handicapped**

Phase I w/WRF (9/92 to 9/93) - \$ 275,000

Phase II w/VNAH (9/93 to 9/95) - \$ 750,000

**3. World Vision**

Phase I (9/91 to 9/93) - \$1,075,000

Phase II (9/93 to 9/95) - \$1,000,000

Includes support for two expatriates: 1 prosthetist, 1 administrator.

**4. Health Volunteers Overseas**

Phase I (9/92 to 5/94) - \$ 750,000

**B. Germany - GTZ - DM 5,400,000 (\$ 3,078,000)**

1. Construction of and equipment for a new prosthetics and orthotics training center in Hanoi.
2. Financial and technical assistance for national survey of the disabled. Scheduled to begin in May 1994.
3. With separate funds, provides financial support, equipment, training and technical assistance for the Ba Vi Rehabilitation Center.

**C. Norway - NORAD**

Financial support for the Hai Phong Rehabilitation Center.

**D. International Committee of the Red Cross**

Financial support, training and technical assistance for the Ho Chi Minh City Rehabilitation Center, including support for 3 expatriate technicians.

E. Terre Des Hommes (Germany)

Financial support, equipment and technical assistance for the Center for Rehabilitation of Paralyzed Children in Ho Chi Minh City. Support provided since the center opened in 1983.

F. Canada

G. United Kingdom

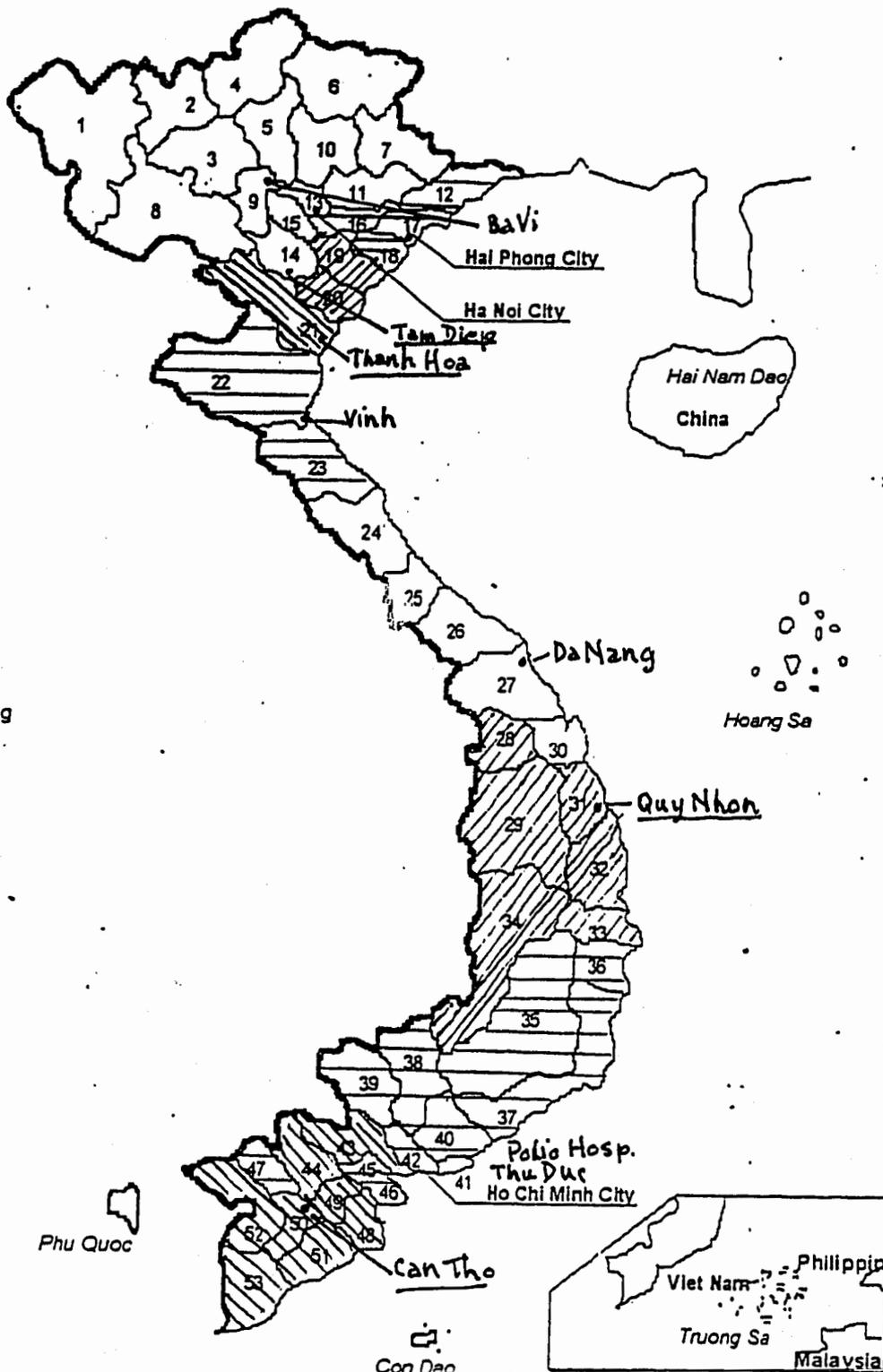
Discussions currently underway regarding U.K. support for the Tam Diep Rehabilitation Center.

**APPENDIX D: MAP OF CENTERS & PROVINCES**

# VIET NAM

POPULATION  
MILLIONS CENTERS

	PROVINCE
	01. Lai Chau
	02. Lao Cai
	03. Yen Bai
	04. Ha Giang
	05. Tuyen Quang
	06. Cao Bang
	07. Lang Son
	08. Son La
	09. Vinh Phu
	10. Bac Thai
5.8	Ba Vi
	11. Ha Bac
	12. Quang Ninh
6.2	Kien An - (Haiphong)
	13. Ha Noi City
	14. Hoa Binh
	15. Ha Tay
	16. Hai Hung
	17. Hai Phong City
	18. Thai Binh
3.1	Tam Diep
3.0	Thanh Hoa
3.6	Vinh
	19. Nam Ha
	20. Ninh Binh
	21. Thanh Hoa
	22. Nghe An
	23. Ha Tinh
	24. Quang Binh
	25. Quang Tri
4.7	Da Nang
	26. Thua Thien-Hue
	27. Quang Nam-Da Nang
	28. Kon Tum
	29. Gia Lai
4.5	Quy Nhon
	30. Quang Ngai
	31. Binh Dinh
	32. Phu Yen
	33. Khanh Hoa
	34. Dac Lac
	35. Lam Dong
	36. Ninh Thuan
	37. Binh Thuan
	38. Song Be
	39. Tay Ninh
	40. Dong Nai
	41. Ba Ria-Vung Tau
	42. Ho Chi Minh City
9	H.C.M. City
	43. Long An
	44. Dong Thap
	45. Tien Giang
	46. Ben Tre
	47. An Giang
1	Can Tho
	48. Vinh Long
	49. Tra Vinh
	50. Can Tho
	51. Soc Trang
	52. Kien Giang
	53. Minh Hai
9	TOTAL



BEST AVAILABLE DOCUMENT

**APPENDIX E: TRIP REPORT PREPARED BY MEL STILLS, C.O.**

**SOUTHWESTERN**  
THE UNIVERSITY OF TEXAS  
SOUTHWESTERN MEDICAL CENTER  
AT DALLAS

Mel Stills, C.O.  
Assistant Professor

Department of Orthopaedic Surgery  
Robert W. Bucholz, M.D., Chairman

November 22, 1993

Mr. Charles Johnson  
Sr. Associate  
International Science & Technology Institute  
1129 20th Street, NW  
Washington, DC 20036

Dear Charles:

I included my observations made during our site visit. I don't know if you wish to utilize it as an addendum or for future background information. I will have pictures available for you in the very near future.

It was certainly a pleasure traveling with you and I hope to be able to participate in other US AID projects with you again in the future.

Sincerely,

  
Mel Stills, C.O.

MS/dr

Enclosure

EXPERIENCES AND OBSERVATIONS MADE  
BETWEEN OCTOBER 23 & NOVEMBER 6, 1993  
IN VIETNAM

Thu Duc Center is primarily a wheelchair production area and a reported vocational training school. There is little evidence of vocational training taking place during our visit. We saw one young lady operating a sewing machine but no instructors were observed. There were no other vocational program underway during our visit there.

The wheelchair production appears to be a well oiled program. Chairs are manufactured as ordered. They are of the classic E&J design which has been described in other reports. They are considering copying a sports chair design which was introduced to them by a recent visitor to their Center.

The wheelchairs appear sturdy and well made. Imported components are limited to the wheel bearings. Tires, bicycle spokes and wheel rims are all purchased locally. The remainder of the chair is made from tubular steel which is shaped on site. There seems to be some concern about chrome treating metal in that they believe that it will wear off quickly due to the high heat and humidity found in that area.

Prosthetic production was not underway. There were no orders placed for prostheses and the shop was basically closed down. Now that the grant has been awarded prosthetic production is to begin again.

The area set aside for prosthetic production is totally inadequate. It is too small, crowded, unlit, old and dirty. There are few tools and basically no equipment available. Prosthetic

production if started again should be moved to one of the unused vocational training buildings that are well lit, open, and have the appearance of a professional working environment. Personally, I doubt this Center's commitment to prosthetic patient care.

Can Tho visited on the 26th and 27th of October

This Center is as described in previous reports. Working space continues to be crowded, dirty, and ill-equipped.

There were over 100 patients there on the day we arrived. We went immediately into our meetings with the Center Director, Ex-Director, and Mr. Ca. About one hour into our meeting Mr. Ca excused himself to begin registering some of the patients that had arrived that day. This group of patients had a wide variety of disabilities and age groups. They apparently show up when its advertised that Mr. Ca is to be at the Center. We toured the facility later that afternoon. Prosthetic production is underway. Several trial fittings were observed. Walking patterns and gait deviations were not being observed by any of the staff limb makers that we saw. Patient appeared to be just walking in the area adjacent to the fabrication area. I think socket fit may have been checked but there was no attention given to alignment.

We observed one fitter measuring several below knee patients stumps. A few minutes later we observed two ladies casting these same patients for their prosthesis. There was no apparent communication between the gentleman taking the measurements and the ladies casting the patients. There were no anatomical landmarks laid out on any of the patients.

We observed cast modifications that consisted of primarily of

a large build up added to the anterior surface of the cast. There were no measurements taken of the model during modification.

We observed no definitive fittings of any prostheses or orthoses. There were over 100 prostheses waiting in a large meeting room to be delivered. We were informed that the patients had been sent away and would return the day after we left for their final fitting and delivery of these limbs. I hope this is not a deliberate effort to prevent the team from evaluating the quality of prosthetic/orthotic services by this Center. It is reported that all fittings are observed by Mr. Ca and this results in considerable delays in delivery of the limbs to the patients. The new Center's director is very concerned about these delays which he says can be up to three months. A better system must be developed. The current system does not address quality issues at all but seems to be primarily concerned with financial accounting. This practice of delaying fittings is not a part of any other prosthetic delivery program I have witnessed in Vietnam.

Mr. Ca has asked me to help set up some type of training program for this Center. He has given me his visitation dates for 1994 and I will work with US ISPO to organize an ongoing training program and identify potential technical participants. Once the course outline is determined and the prosthetic speakers identified I will forward this information on to Mr. Ca for his implementation. The plan is for the American certified prosthetist to spend a minimum of one week at the Can Tho Center observing fittings, and providing instruction to Center staff. Instruction will include a pre-arranged series of lectures that follow an outline to be developed for 1994. The majority of instruction will

be "hands on" demonstrations in the lab with assistance in all phases of limb production.

It would be best if at least two American prosthetists participated in each of these fittings and teaching events. It is almost impossible to provide any direction or instruction independently when hundreds of limbs are being delivered over a two to three day period. Two individuals working together can have a greater impact, and frankly, make being at Can Tho for a week or more a little more tolerable.

Quin Nhon, October 28, 1993

This Center has not been evaluated before or visited by me. This Center is located within a hospital setting. One of the first things that impressed me was that I could distinguish staff from patients and/or visitors. The staff of the limb department all were wearing clean blue lab coats and projected a professional manner. The lab areas were all well maintained and the production areas were noted to be clean and well organized. Adequate but well used tools and equipment were available. Production could be improved with the addition of belt or disk sanders. Currently all grinding and cutting being done in finishing prostheses is accomplished using prosthetic carvers. The use of a band saw to pre-shape the wooden set ups would accelerate prosthetic production considerably.

A great deal of imported heavy prosthetic production equipment and tools were noted to be in the store room. These apparently were ordered by a Quaker organization several years ago. I get the impression that these tools and equipment supplies are being

hoarded because of the fear that one day things may not be available. Apparently there were plans at one time to open the satellite facility but those plans have been abandoned, yet the materials and equipment have not been placed into production.

Prosthetic orthotic production at this facility was impressive. The prosthetic alignment I observed appeared appropriate even though there were no alignment fixtures in evidence. AK alignment could have been improved by increasing socket flexion. Overall, I would say that this Center was doing a good job at delivering prosthetic services.

Orthotic services are almost entirely lower extremity fittings. These fittings look good with the uprights well contoured and joints appeared in appropriate alignment. Hip joints and pelvic bands did not correspond well to the anatomic joints. They appeared high and anterior but the patients were stable when walking. We observed one adult spinal cord injured patient struggling to walk in bilateral hip knee ankle foot orthoses. He would have been better served in a wheelchair but there are no funds allocated for wheelchairs at this Center. This patient pleaded with us to be given a chair but at this time there appears to be no allocation of funds. This patient will never become a community ambulator in braces but no other options are available. We also observed bilateral short above knee amputees walking about using their arms and wooden blocks to elevate their buttocks off the ground. They too would have benefitted from a chair, but the grant does not provide for the delivery of this service. This issue should be addressed if we are undertaking projects that demand the delivery of appropriate technology.

Overall, the Quin Nhon Center is doing a good job in both prosthetic and orthotic service delivery. The patient treatment areas and bathroom facilities all need to be cleaned and something done to reduce fly infestation.

The Da Nang Center, October 30, 1993

This facility continues a major reconstruction program. Administrative areas have recently moved into a new two story building. Component fabrication areas are currently under construction. Component fabrication has continued in a very crowded, dark, and unsafe environment. Safety violations are observed through out this Center.

A new piece of equipment has been added which was not seen during a previous visit. They have a device that produces the plastic forearm pieces used in crutch production. The forearm pieces are extruded by grinding plastic and heating it in a screw type injection molded system. Raw plastic is fed into an open screw window approximately 3x4 inches by hand. One slip by the operator and his arm would be pulled into the screw mechanism and this would certainly result in an arm amputation probably at the elbow level. A simple wood pusher cut slightly larger than the opening would permit safer operation. Exposed electrical wires are also attached to the heating elements and these electrical wires were noted to be hot and the insulation was burned off at least six inches back from the attachment. Electrical safety violations are noted through out this Center. Very few pieces of electrical equipment had electrical plugs attached at the end of the wire. All of the plugs had been cut off and bare wires were plugged into

electrical sockets. Pieces of wood or other objects were used to help hold the wires into an extension cord lying on work benches. On the last day of our training course electrical plugs were added to the tools we were using. This is after it was learned that we had arranged to go into town that day and buy up plugs for the Center.

There were over 500 lower limbs in production in this Center. The majority are going to outreach centers. Each pile represented a center. Of the over 500 limbs in production very few, less than 20, were finished. In the week we were in the Center providing instructions they continued to intake new patients and cast for limbs. These casts were added to the pile of uncompleted projects. I would think that we would try and complete work already under way before adding new patients.

These new patients were all wearing old worn out limbs that were in need of replacement but, in fact, were still serviceable. During the day of our evaluation and throughout the following week while we were conducting the instructional programs, I observed no definite fittings of any prostheses or orthoses.

The only way I can assess a project that involves the delivery of prosthetic orthotic services is to observe the definitive or final fitting of those devices. I would hope that in the future clear instructions would be given to all sites that when an evaluation team was scheduled that definitive fittings would be arranged to coincide with the inspection team's evaluation of that Center. Overall I believe the quality of prosthetic service has fallen a notch at the Da Nang Center since my May visit. Mr. Watkins concurs and is trying to sort out what has happened.

Visits to the ICRC Project and the Terre des hommes Children's Project in Ho Chi Mein City

The ICRC project continues to provide innovative approaches in the delivery of prosthetic services in Vietnam. A new American prosthetist has been added to the staff. Mr. Thomas Keolker, a graduate of the UCLA Prosthetics program has replaced one of the other ex-patriots who has rotated out of the program. I believe the ICRC approach is going in the right direction. It minimizes the need for imported prosthetic components. The durability and function of these prostheses has not been well documented but all indications are that they will last as long as the more conventional laminated wood set ups currently used.

It would be nice to know if there has been any testing done. The foot certainly needs an evaluation. Problems with feet lasting less than one year seem to be a major problem in Vietnam. We were shown some ICRC feet at the Quin Nhon Center that had broken just after a few weeks. I believe these were of the older design. Durability of feet is a major issue in Vietnam and needs to be addressed.

The knee joint needs evaluation before it is widely used and breakage begins to occur. This knee is fabricated with polypropylene and may work very well but I am unaware of any testing that has been conducted to date.

The ICRC project is an impressive operation and I believe it provides the proper model to be followed. I don't believe they have been contacted by PRF as of yet. I know that Mr. Tue is impressed with its approach and Daniel Watkins from World Vision was visiting the Center again the week following the course in Da

Nang.

The Terre des hommes children's center seems to focus on all aspects of children's disabilities. We saw a number of cases of polio and cerebral palsy. This Center was a very clean and well laid out operation. The Director is a delightful lady and doctor that enjoys her work. The quality of shoe work and bracing was equal to any you would see in North America. The introduction of thermoplastics could take place in this Center because of the existing high quality work and knowledge. The orthoses I saw were laid out correctly and joints properly coincided with the anatomic joints. They appear to function quite well. Components are of the Ba Vi design and edges are not rolled and the metal is not polished. This may be due to the lack of proper materials and equipment. The leather work was clean and well done. Overall, the orthoses I saw were functioning quite well. There doesn't appear to be any childrens wheelchair or seating systems available in Vietnam. Many of the kids are using adult size chairs. A few used childrens chairs had been donated from Europe and North America. Production of childrens chairs should be explored in Vietnam.

The Director asked for assistance in training her staff. From what I saw I would suggest that they could provide training and become a model for some other Center's regarding childrens orthotic services.

It was a pleasure to visit this very well organized Center.

US ISPO AMPUTATION AND LOWER LIMB  
PROSTHETICS INSTRUCTIONAL COURSE

Da Nang, November 1-6, 1993

The Amputation Surgery and Lower Limb Prosthetics instructional course went well. There were representatives from each of the MOLISA Centers present. There were over 40 participants with approximately 30 being orthotic/prosthetic practitioners and the remaining 10 or more surgeons. Five below knee prostheses were made and two above knee prostheses. Dr. Frank Gottschalk performed three amputations, one below-knee, one through-knee and one above-knee. He also attended numerous clinics and patient presentations.

Changing old habits and introducing new technology is going to be very difficult. They are really unfamiliar with the concept of instructional programs. They all appear to have a lot of experience, but lack the background to understand why things should be done in a certain way. They do not appear ready to accept what they are being told but wish to rely more on their experience. They are use to doing without proper tools and equipment. There seems to be a tendency to hoard things. Simple tools are not available and those that are were worn out 10 years ago. It took about five minutes to drill out a 3/8" hole in a 1/2" piece of wood because the drill bit was completely worn out. All the chucks to the drill presses have been lost and they use a hammer and a chisel to loosen or tighten the chucks. A great deal of time is wasted doing things the hard way. We needed various tools that when asked for through an interpreter could be produced from under a locked

bench. When we set the tool down, turned around, and went to pick up the tool again we found that it had already been locked back up again. Not a single item was readily available.

It is fairly standard practice to use a polyester resin for prosthetic production in the United States. We are taught to promote this plastic with at least a 3% promoter and generally 4% is considered normal. In Vietnam they promote polyester resin at 1% and in some cases at the 2% level. This lower percentage rate delays polymerization, setting time of the plastics which results in a fuzzy, tacky socket if it is removed from the model during the normal time frame. In time the material will totally harden but these long delays prolong fabrication time and may cause a less than desirable result.

We had a devil of a time convincing them that they should promote their plastic at the higher 4-5% rate. When we asked that they promote at 4% because of our time restraints it became obvious that they ignored our requests and promoted at their lower rate. We mixed and measured our own plastic on several occasions to demonstrate the better results and the time savings, but I am fairly sure they are going to continue to do it their way. They may be using less promoter simply because they want to make their supply last longer.

We provided instruction in both below knee and above-knee prosthetics. Our first instruction was in the BK prosthetics which included all aspects of evaluation, casting, fabrication, alignment and fitting. During the course of our week there production continued in the Da Nang Center with some patients being seen by staff during the course. It was interesting to note that about

eight casts were taken for below-knee prostheses after we had given the instruction on BK casting. Not one of the things we presented were attempted in these eight castings. No anatomical landmarks were identified and casting procedures were ignored.

Changes in prosthetic orthotic service delivery will be very slow to occur. Only continued instruction and demonstration will have any lasting impact. The one project in Vietnam that appears to be making inroads into making change is the ICRC project in Ho Chi Mein City. I think this is because there are three ex-patriots actively working in the production area to initiate these changes.

All the sockets fabricated during the course fit well and proper prosthetic alignment was demonstrated in each of the seven fittings. The rationale for alignment was demonstrated and this was a total departure from what they are accustomed to. There were six or eight individuals who were observed taking notes and trying to get as much out of it as they could. The remainder appeared to be more as an observer. I think the one individual that stood out trying the hardest was the prosthetist from Can Tho. He was in on every aspect of the training and appeared to get the most from the instruction. A close second was the prosthetist from Quin Nhon who had been previously trained by Roger Marshall in the 1970's. He, too, was very attentive but had (I already know this stuff) attitude.

There probably needs to be some kind of annual event bringing the key people together in Vietnam, but a lot of individual attention will be needed in each center if changes are expected to occur. I know that Daniel Watkins plans on initiating some instructions with small groups, two or three at a time. These

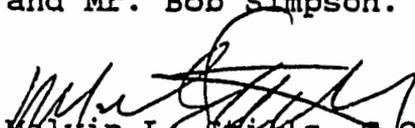
small group instructional programs may influence the changes necessary to improve quality and increase production.

Originally I had believed that everyone was working to maximum capacity, but after observing some of the techniques utilized during the course of our instructional period, I think production could be increased without reducing quality by simply introducing more efficient ways, i.e. better lamination procedures, improved alignment techniques, introduction of vacuum assisted laminations, the use of the bandsaw to preshape prosthesis, replacement of worn out tools and equipment, etc.

Another issue that must be addressed soon is in regards to volunteer organizations going into Vietnam providing high tech instructions. An example of this has been found with the Needs International Group which are in Hanoi, the second week of November of this year providing an instructional program for primarily surgeons. I reviewed the course outline and there is little of this course that can be implemented into actual practice for several years to come. Instructional materials teaching a surgeon how to do an anterior spinal decompression and pedicle screw fixation, or Scottish Rite instrumentation of the spine cannot be undertaken in Vietnam anytime in the near future. This technology is simply too advanced and they have none of the instrumentation or operating room equipment necessary to conduct these procedures. This issue will be addressed in greater detail by Dr. Gottschalk in his report. I am sure that these agencies going into Vietnam are all well intentioned but are simply not well thought out as to patient needs. Efforts should be made with organizations such as Health Volunteers Overseas, Orthopaedics Overseas, World

Orthopaedic Concern to better coordinate instructional programs to ensure their appropriateness. This concludes my observations made while in Vietnam. There is such a mixture of emotions about Vietnam and its needs it is difficult to clearly describe the conditions. Where prosthetics and orthotics fit into the needs of this country it is difficult to assess when so much attention is needed in the areas of roads, transportation, electricity, water, sewage treatment, and the environment. The majority of people in this country are desperately poor and with salaries being so extremely low there is little stimulation to go onto health care delivery programs.

I would like to thank US AID for the opportunity to participate in both the evaluation process and the opportunity to work with two professionals of the caliber of Mr. Charles Johnson and Mr. Bob Simpson.

  
Melvin L. Stills, C.O.  
November 8, 1993

MS/dr

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**APPENDIX F: TRIP REPORT BY DR. FRANK GOTTSCHALK, M.D.,  
AND DANIEL RAMSEY, CPO**

**SOUTHWESTERN**  
THE UNIVERSITY OF TEXAS  
SOUTHWESTERN MEDICAL CENTER  
AT DALLAS

Frank Gottschalk, M.D., FRCS Ed., FCS (SA) Orth.  
Associate Professor

Department of Orthopaedic Surgery

Distinguished Chair in Orthopaedic Rehabilitation

November 17, 1993

Mr. Robert Simpson  
Deputy Director  
Pritech  
1925 N. Lynn St., #400  
Arlington, VA 22209

Dear Mr. Simpson:

Enclosed is the report of the recent visit for US AID to Vietnam.

The report is signed by myself and Dan Ramsey.

We both appreciate the opportunity to have visited Vietnam and hopefully to have been able to contribute to the program.

Respectfully,



Frank Gottschalk, M.D.

FG/dr

Enclosure

12/06/93 00:00

Report on Site Visit  
US AID War Victim Program, Vietnam  
October 23 - November 6, 1993

A site visit to four different facilities in Vietnam was done for US AID to evaluate the services and needs of the war victims program. The visit started in Hanoi and ended in Da Nang and lasted two weeks.

Prosthetics Research Foundation, Hanoi, Wednesday, Oct. 25, 1993

Approximately 100 lower extremity prostheses are being made every month. The facility says they have the capacity to make 200 limbs, but are hindered by lack of components.

There are five people involved in limb manufacture, none of whom have had any prosthetic training. Two are former physicians, two engineers and one high school graduate. The staff state each prosthesis costs of approximately \$220.00 and that all components are imported from Seattle.

The Center was unable to show patients who had been fitted with prosthesis more than nine months previously. Five new amputee patients not war related, were in the process of being fitted and were not given any formal gait training. None of the staff are qualified to teach the patients gait with the prosthesis. Visit to some patients at their village showed that the prosthetic foot and cosmetic cover did not last more than six months. The patients were unhappy with the cosmesis of the prosthesis and had difficulty with walking because of the prosthetic foot. The sockets were not well finished and patients said they were not comfortable.

The staff were unaware of any arrangements to obtain locally

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made components. Overall the project is disappointing and expensive for the quality and type of prosthesis provided. Based on the durability of locally made prostheses and components, the PRF project does not meet the criteria for providing inexpensive, durable, locally made artificial limbs. There is no provision for maintenance of the prostheses and no follow-up of patients who have been fitted.

They were unable to modify sockets, which already had been fabricated. Because of the lack of adequate prosthetic training, modification made on the computer were not appropriate. Dr. Huynh noted that many patients complained of the plastic socket being too hot. It was his opinion, as well as from my observations that this project was not adequately meeting the needs of the patients.

Thanh Hoa, Tuesday, October 26, 1993

This facility is sponsored by World Vision and serves a population of three million people. An estimated 6,000 amputees are thought to be in the area, with approximately 2% being new cases. One thousand five hundred patients are seen per year and the facility makes 100 BK and 50 AK prostheses per month. The rest are Symes, though knee and upper extremity. The average prostheses costs \$30.00 and is a laminated wood socket with a durable rubber type foot. A leather liner is used in the BK socket. The facility provides outreach to the province and many of the patients that we saw had poorly done amputation surgery, but the prosthetic fitting was able to accommodate this.

One striking event was a visit to a village to see a family where the husband and wife were both war amputees. The husband was

fitted with a locally made AK prosthesis which he had had for over a year. The wife had been fitted with a PRF BK prosthesis seven months previously. Despite both being similarly active, the PRF prosthesis had disintegrated and the patient had difficulty in using it. See enclosed picture. This highlighted the problem of the PRF prostheses versus the locally made prostheses.

A difficulty which the Thanh Hoa facility was having, was obtaining plaster of paris for the casts, and were using cement, which made socket modifications difficult or impossible.

Overall this facility was providing good service and value for the dollars spent.

A visit was done to the general hospital in Than Hoa. This hospital was extremely primitive and lacked most basic forms of equipment for even rudimentary patient care. (See attached report.)

Vinh, October 27, 1993

This facility is medium sized and makes upper and lower extremity prostheses. They also make their own crutches. A large workshop, well maintained and provided with all the necessary machine tools from Otto Bock. The Workshop is well maintained and clean and adequate records are kept. Local components are used, obtained from the Ba Vi Center, near Hanoi. A below-knee prosthesis costs between \$28 and \$30 whereas an above-knee prosthesis costs approximately \$40. A satisfactory level of service is provided and the prosthetists have had some prosthetic training. A problem with knee extension alignment for through-knee and above-knee prostheses was identified. The prostheses are

finished by laminating over a wooden socket. They have 11 personnel on site for making prostheses as well as a therapist and physician. The facility makes approximately 1800 prostheses per year. Outreach is available in 14 to 22 districts and involves approximately 50-70 patients every 6-8 weeks. Approximately 100 patients are fitted per month, on site.

The rehabilitation offered by the facility is satisfactory. Provision is available for overnight stay and a physical therapist assists with gait training. An operating room is on site for orthopaedic procedures and the anesthesiologist is available from the nearby Provincial Hospital. The operating room is relatively primitive and sparsely fitted. Whatever equipment is available is old and only simple orthopaedic procedures can be done, e.g. tendon transfer, amputation. No diathermy or suction is available, and anesthesia is spinal or intravenous ketamine.

Overall, the level of service provided by the Vinh facility meets the local needs at the present time, in terms of prosthetic provision, and has the facility to expand as more patients are brought into the system. The prostheses that are made are durable and patient acceptance is high.

Da Nang, October 30, 1993

This is the largest facility that we saw and a newly opened administrative building has helped relieve a shortage of space. The new workshops are large, but not well equipped. Several safety hazards were noted. The equipment needs updating and improvement. The below-knee and above-knee prostheses are made by lamination polyester resin.

The Center serves 5 million people from the surrounding five provinces. It is estimated that there are 150,000 disabled people, of which 15,000 are amputees, related to the war. Eighty percent have received a limb since 1975 and 50% have more than one leg. Most prostheses need to be replaced after three years, but many patients have used a leg for ten years. The Center sees ten new traumatic amputees per year. Outreach occurs in three provinces and is hampered by poor roads and transportation. Approximately 50% of patients are seen through the outreach program. Eighty percent of the patients are war victims and up until 1990 the Facility served only veterans from the North Vietnamese Army. Since 1990 all patients are seen.

The facility has 4-5 partially trained physical therapists, with an adequately sized therapy gym, but has very little equipment for exercises. Gait training is taught and therapy is provided for other musculoskeletal related disorders, but is poorly done. An operating room is on site for orthopaedic procedures. It is sparsely equipped and primitive and has no suction or diathermy and very old fashioned instruments. Anesthesia is spinal or intravenous ketamine and the anesthesiologist is provided by the "C" Hospital, behind the facility. Only very basic orthopaedic surgery can be done, e.g. amputation, fracture manipulation and tendon transfer. Water is filtered on site for washing hands in the operating room and 100% alcohol is used to disinfect the surgeon's hands.

A plate and screw set is available for fracture fixation, but the ancillary equipment such as plate benders, drills, drill sleeves, plate holders and adequate X-ray facilities are absent.

Poor surgical technique was noted as well as the doctors having inadequate training and knowledge regarding basic orthopaedic and fracture management.

The level of skill of the prosthetists needs to be improved as does the training of the physicians working at the facility. The quality of the prostheses has diminished somewhat, at the expense of quantity and output. Lack of some pieces of machinery increases production time, which results in some quality compromise.

A five day training course was held in Da Nang to teach above-knee and below-knee prosthetic techniques. A course for physicians on amputations of the lower extremity and general orthopaedic principles was conducted concurrently.

This facility has great potential and overall tries to provide an adequate patient service.

#### Summary

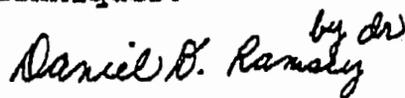
Based on the four facilities visited, the PRF project does not meet the criteria for inexpensive durable prostheses. It does not compare favorably with the other three facilities visited. Patient satisfaction was lower with the PRF prosthesis and high with prostheses provided by the Vinh facility.

It is recommended that the PRF project use all locally available components except for the sockets, which are computer aided designed and made. A well trained prosthetist should be part of the team. Money to PRF could be better used in Vietnam for obtaining local components which are cheaper and more durable and more accepted, than those provided by the Seattle based project. Since the PRF project may be a research project, serious

consideration should be given to changing the components to make them cheaper and of another material so as to be more durable and cosmetic.

Education for orthopaedic surgeons and trauma surgeons needs to be at the most basic level until the country has improved its infrastructure of roads and sanitation to allow easier access for patients and an upgrading of surgical techniques.

  
Frank Gottschalk, M.D.

*by dr*  
  
Daniel D. Ramsey, C.P.O.

FG/dr

Enclosures

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