

A.I.D. EVALUATION SUMMARY - PART I

PD-AAZ-681

1. BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS.
2. USE LETTER QUALITY TYPE, NOT "DOT MATRIX" TYPE.

IDENTIFICATION DATA

A. Reporting A.I.D. Unit: Mission or AID/W Office <u>USAID/El Salvador</u> (ES# _____)		B. Was Evaluation Scheduled in Current FY Annual Evaluation Plan? Yes <input checked="" type="checkbox"/> Slipped <input type="checkbox"/> Ad Hoc <input type="checkbox"/> Evaluation Plan Submission Date: FY ___ Q ___		C. Evaluation Timing Interim <input type="checkbox"/> Final <input checked="" type="checkbox"/> Ex Post <input type="checkbox"/> Other <input type="checkbox"/>	
D. Activity or Activities Evaluated (List the following information for project(s) or program(s) evaluated; if not applicable, list title and date of the evaluation report.)					
Project No.	Project /Program Title	First PROAG or Equivalent (FY)	Most Recent PACD (Mo/Yr)	Planned LOP Cost (000)	Amount Obligated to Date (000)
519-0342	Short-term assistance to civil amputees - OPG	4/87	12/88	720	720

ACTIONS

E. Action Decisions Approved By Mission or AID/W Office Director		Name of Officer Responsible for Action	Date Action to be Completed
1.	The Temporary Prosthesis Program providing Assistance to Civilian amputees should not be extended beyond its present planned conclusion of December 31, 1988.	J. Naponick DIR/HPN	12-31-88
2.	Monitoring efforts of longer term program administered by the Teleton Foundation should emphasize patient follow-up and prosthetic quality control.	C. Bannerman HPN	on going 1989
3.	Request the Teleton Foundation to submit to USAID/El Salvador a comprehensive report covering services provided to civilian amputees by FUNTER and specifically, the status of all amputees who received a temporary prosthesis through the USAID/ES Malta Project.	C. Bannerman	8-31-89
4.	The scheduled evaluation of the FUNTER Project should include a review of the prosthetic quality control and patient follow-up mechanism.	R. Thornton ADIR/HPN	5-31-90 7-31-90

APPROVALS

F. Date Of Mission Or AID/W Office Review Of Evaluation: _____ (Month) _____ (Day) _____ (Year)

G. Approvals of Evaluation Summary And Action Decisions:

Name (Typed)	Project/Program Officer	Representative of Borrower/Grantee	Evaluation Officer	Mission or AID/W Office Director
	<u>C. Bannerman</u>	Gerald Coughlin	H. Diaz de Medina	W. Kaschak
Signature	<u>R. Thornton</u>		<u>[Signature]</u>	<u>[Signature]</u>
Date			<u>6/16/89</u>	<u>6/16/89</u>

ABSTRACT

H. Evaluation Abstract (Do not exceed the space provided)

USAID granted \$720,000 to the Salvadoran Knights of Malta to support the establishment of an amputee registry and to fit up to 500 lower-limb amputees with pre-fabricated, modular prosthetic devices known as the Third World Leg. These temporary artificial limbs, referred to here as pylons, consist of a plastic socket supported by straps and connected by a fiberglass-epoxy tube to either a rubber tip or a foot. Since the project was implemented without serious programmatic or technical problems, the focus of this end of project evaluation was to determine the appropriateness of these pylons. Specifically, how well they were utilized and their durability.

As part of the process, of the 477 beneficiaries, 121 were requested by telegram or radio message to go to a local Human Rights Office or hospital on a given date for a medical examination and interview. Sixty-seven appeared and participated in the survey. These included 35 below the knee and 32 above the knee amputees.

The frequency of use of the below the knee pylons was high regardless of sex, age, training, and whether a rubber tip or foot was used. Eighty percent of the below the knee amputees claimed to use their pylons continually on a daily basis. Above the knee pylons were used less frequently, but there were many in both sexes and all age groups who used their pylons daily during most of the day. The use of a foot in place of the rubber tip significantly increased the utilization of the above the knee pylons as did additional training and physical therapy after the original fitting.

Overall, the pylons were still in good condition although the belts, sponges and tips showed some wear. In numerous cases the rubber tip, foot or tube between the socket and tip had come unglued and four of the sockets were reported to have been broken, cracked or replaced. Three of the pylons appeared to have been improperly adjusted for the height of the adult amputee at the time of fitting. No serious medical side effects were observed, although minor problems such as blisters and abrasions were experienced by many of the amputees when they first used their pylons.

The Third World Legs are an effective emergency measure to provide prostheses rapidly to a large population of amputees. However, to facilitate maintenance, replacement of parts, adjustments for changes in the stump of adults and growing children and to provide prostheses readily to new amputees, it is recommended that permanent, in-country prosthetic production, care and services be developed simultaneously. Hence, once the backlog of amputees has been provided with the temporary pylons, more permanent in-country capabilities are in place and functioning so that follow-up care can be provided for pylon users as well as new amputees awaiting prosthetic care.

C O S T S

I. Evaluation Costs

1. Evaluation Team		Contract Number OR TDY Person Days	Contract Cost OR TDY Cost (U.S. \$)	Source of Funds
Name	Affiliation			
Dr. Marny D. Barrau	Independent	30 person days	7,333.00	Project Funds
2. Mission/Office Professional Staff Person-Days (Estimate) <u> N/A </u>		3. Borrower/Grantee Professional Staff Person-Days (Estimate) <u> 30 </u>		

A.I.D. EVALUATION SUMMARY - PART II

SUMMARY

J. Summary of Evaluation Findings, Conclusions and Recommendations (Try not to exceed the three (3) pages provided)

Address the following items:

- | | |
|--|--|
| <ul style="list-style-type: none"> • Purpose of evaluation and methodology used • Purpose of activity(ies) evaluated • Findings and conclusions (relate to questions) | <ul style="list-style-type: none"> • Principal recommendations • Lessons learned |
|--|--|

Mission or Office: USAID/El Salvador	Date This Summary Prepared: 6/15/89	Title And Date Of Full Evaluation Report: Dec., 1988 Evaluation of the Order of Malta's short term Assistance to Civilian Amputees in El Salvador
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PURPOSE Prior to 1987 the growing population of amputees in El Salvador had few alternatives for prosthetic devices and other rehabilitation services. The Ministry of Health and the Salvadoran Rehabilitation Institute (ISRI) were not able to provide the necessary assistance to the amputees and the few commercial sources for prosthetic devices could provide only a minimum number of devices which were, in any case, too expensive for the majority of the amputee population. USAID granted \$500,000 to the Salvadoran Knights of Malta to support the in-country logistic costs of establishing an amputee registry and to fit up to 500 lower-limb amputees with pre-fabricated, modular prosthetic devices known as the Third World Leg. An amendment later increased the grant to \$720,000.

Since the implementation of the project was without serious programatic or technical problems, the focus of this internal evaluation carried out by the Knight of Malta was to determine the appropriateness of the Third World Legs, referred to here as pylons. Specifically, the evaluation was geared to determine how well received the pylons were; their durability and if the users incurred any problems or side effects.

METHODOLOGY Of the 477 beneficiaries in the Knights of Malta project, 121 were requested by telegram or radio message to appear at a near-by Human Rights Office, Knights of Malta headquarters or hospital at a specific date. Sixty seven were evaluated by the team doctor and interviewed by a team leader and a host country counterpart.

For additional information on the project and on pylons in general, contact was made with the Knights of Malta project staff, the past Executive Director of Orthomedics - the US company which produces the Third World Legs and that actually carried out the fitting in El Salvador, staff from the Salvadoran Teleton Foundation for Rehabilitation (FUNTER) and US prosthetic experts.

FINDINGS The overall reponse of pylon recipients sent telegrams (including 12 who came too late to be included in the interviews) was 70% with the rate as high as 80% in the vicinity of San Salvador where there is less conflict and bus service is good and relatively inexpensive. Response to radio messages was only 46%.

A total of 67 pylon recipients were included in the sample. Thirty-five of these were amputated below the knee and 32 above the knee. Eighty percent of below the knee amputees claimed to use their pylons continually throughout the day on a daily basis. Of the above the knee amputees, however, only 41% stated continual use of the pylons and 47% said that they used the pylon only a few times a week or not at all. Of the 17 females in the sample, 65% made continual use of the pylons while 60% of the males were in the high use group.

Nine of the amputees included in the sample were under 20 years of age. Of these, 67% (6) used their pylons only occasionally or not at all. Two of the six had above the knee prostheses provided through Project HOPE. One amputee had grown in height but had not had the height of his pylon adjusted. When the amputees were grouped by age in 10 year intervals, the 20 to 29 year olds appeared to make the best use of the pylons with 88% claiming to make constant use of the pylons. However, since the sample size is relatively small, the amputees were categorized as being less than 40 years old or 40 and above in which case, age appeared to have little effect on the rate of utilization of the pylons.

The pylons were provided with either a rubber tip or foot. Most amputees said that they preferred the foot since it looked more natural. Of the 41 amputees interviewed who had a foot, 73% claimed to make continual use of their pylon as compared to 42% of those interviewed with a rubber tip who said that they used their pylons continually. This increase in use with a foot instead of a rubber tip was even more evident in the above the knee category where only 25% of the pylons with rubber tips were used continually while 67% of those with feet were in the high use group.

In the above the knee category, 50% of the amputees who stated that they had received additional physical therapy or instruction on use of the pylon after the original fitting claimed that they made continual use of the pylon. Only 35% of those who had received no additional instruction were in the high use group. The effect of the additional instruction was not so evident with the below the knee amputees.

Overall, the pylons were still in good condition with the most common complaints being that the belt was worn or that the foot, tip, or tube between the socket and the knee had come loose or unglued. Of the 24 amputees whose pylons still had the rubber tip, 21% reported that the tip had come unglued, loose or came off while 16% of the amputees whose pylons had a foot stated that the foot had come loose. Another six reported that the tube between the socket and the tip or foot had become loose or unglued. Most of these had already fixed the pylons themselves or taken them to either Malta or FUNTER to be tightened or reglued. Four sockets were reported to have been broken, cracked or replaced. These four were all below the knee pylons in the high frequency use group.

Twenty-five percent of the pylon recipients were either unemployed or retired. Fifty-six percent had continued working after their amputation even before receiving their pylons, 34% in the same field as before the amputations but at different activities and 22% in different professions. Nineteen percent of the recipients had been unemployed since they were amputated and were able to find employment only after receiving their pylons.

After evaluating the pylon recipients, the team doctor reported that no amputees exhibited permanent damage caused by the use of the pylons. In the 45 patients still using Malta pylons, he recommended corrective surgery for bone or nerve problems not caused by the pylons in eight patients, six of whom were in the low use categories and suggested that three others be further evaluated for possible surgery. Many of the amputees reported that they had blisters and sores on their stumps when they first began use of the pylons but they all treated themselves without further medical intervention. The team doctor determined that three of the adult population had pylons which were not properly adjusted for their height. He observed that the gait in only one of the three had been affected by the improper height.

CONCLUSIONS The acceptance rate and utilization of the below the knee pylons was high regardless of sex, age, training, and whether a rubber tip or foot was used. Above the knee pylons were used less frequently, but there were many amputees of both sexes and in all age groups who used their pylons continually on a daily basis. The use of a foot in place of the rubber tip significantly increased the utilization of the above the knee pylons as did additional training after the original fitting.

Overall, the pylons were still in good condition although the belts, sponges and tips showed some wear. In numerous cases the rubber tip, foot or tube between the socket and tip had come unglued and four of the sockets were reported to have been broken, cracked or replaced. Three of the pylons appeared to have been improperly adjusted for the height of the adult amputee at the time of fitting.

No serious medical side effects were observed. Minor problems such as blisters and abrasions were experienced by many of the amputees when they first used their pylons, some gait problems were noted.

Only 25% of the pylon recipients claimed to be completely without some source of income. Nineteen percent were unemployed after their amputation but were able to find employment once they received their pylons. Even for those who continued working in the same field as before their amputation, many, particularly in the below the knee category, said that what they did was much easier with the pylon.

The cost of the pylons provided under the project proved to be very expensive, costing between 60% and 75% more than similar devices provided under the longer term USAID backed project. Although this type of project is by no means cost effective, it is an alternative response to an emergency situation.

RECOMMENDATIONS - LESSONS LEARNED: The provision of Third World Legs is an effective emergency measure to provide prostheses rapidly to a large population of amputees. They can be fitted fairly quickly and require little maintenance once they are in place. However, so that maintenance can be preformed, replacement parts supplied, adjustments made for changes in the stump of adults and for growing children and so that provisions can be rapidly made for new amputees, it is recommended that permanent, in-country prosthetic production, care and services be developed simultaneously. Hence, once the backlog of amputees has been provided with the temporary pylons, permanent in-country capabilities are in place and functioning so that follow-up care can be provided for pylon users as well as new amputees awaiting prosthetic care. With the termination of project 519-0342, the Teleton Foundation assumed all the responsibilities related to maintenance, repair and replacement of pylons, as well as training and counseling.

The project as designed did not contemplate a comprehensive program of follow-up attention to take care of children that received a temporary prosthesis. Children require much more attention than other patients due to growth, more utilization of the prosthesis and probably less care of same. It is recommended that if a similar project is designed or replicated, special attention must be given to follow-up services for amputee children.

Two target areas were determined which could enhance the utilization rate of the pylons. In most cases, feet should be used instead of rubber tips. In this study, the number of pylon recipients in the high use group increased from 42% of those with rubber tips to 73% for those with feet. Particularly with above the knee amputees, physical therapy and additional gait training appeared to increase the utilization rate for the pylons. Supplementary training perhaps through extending the time of fitting to include several additional days of instruction and physical therapy could improve the utilization rate of the pylons.

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EVALUATION OF
THE ORDER OF MALTA'S
SHORT-TERM ASSISTANCE TO
CIVILIAN AMPUTEES
IN EL SALVADOR
PROJECT

DECEMBER 1988

EVALUATION OF THE ORDER OF MALTA'S
SHORT-TERM ASSISTANCE TO CIVILIAN AMPUTEES IN EL SALVADOR PROJECT

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EVALUATION OF THE ORDER OF MALTA'S SHORT-TERM ASSISTANCE
TO CIVILIAN AMPUTEES IN EL SALVADOR PROJECT

I. PROJECT EVALUATED

Project No. 519-0342

Title: Short-Term Assistance to Civilian Amputees in
El Salvador

Cost: \$720,000

Effective date: April 15, 1987 to May 31, 1988

Extension: May 31 to December 31, 1988

II. INTRODUCTION

Since April 15, 1987 the Asociacion de El Salvador de la Orden de Malta has been implementing the USAID-funded Short-Term Assistance to Civilian Amputees Project (No. 519-0342). As part of the program, the Knights of Malta, in coordination with the Telethon Foundation for Rehabilitation (FUNTER), the Commission on Human Rights, the Salvadoran Rehabilitation Institute, the Red Cross, Project Hope and other organizations, have established a registry of the amputee population of El Salvador. As of December 13, 1988, there are 1,119 amputees registered of which 750 are lower limb amputees.

A U.S. Certified Prosthetics/Orthotics company, Orthomedics, was contracted to provide and fit 500 pre-fabricated, lower-limb modular prosthetic devices known as the Third World Legs. These devices referred to as pylons in this evaluation consist of a plastic socket connected by a fiberglass-epoxy tube to either a rubber tip or foot. The sockets come in several sizes and minor adjustments can be made in the socket size by heating. The length of the epoxy tube used is determined by the height of the amputee. Orthomedics, assisted by two physical therapists, one psychologist, one social worker and one medical doctor provided through the Salvadoran Rehabilitation Institute, performed the actual fittings of 477 devices in country.

The Knights of Malta's Assistance to Civilian Amputees Program was intended to provide emergency, temporary assistance to the lower limb amputee population in Salvador. This evaluation was directed towards establishing the appropriateness and usefulness of the techniques and procedures followed in the program and the effectiveness and suitability of the Third World Limbs. Data collecting activities were aimed at determining who benefited most from the program, factors which influenced the extent to which the pylons were used by the amputees, the durability of the pylons and the problems encountered by the pylon recipients.

III. METHODS

The evaluation team consisted of five members:

- Marny D. Barrau, PhD. Dr. Barrau received her degree from Colorado State University and has published numerous scientific articles in U.S. journals. She has worked for USAID as a writer, for UNICEF as a statistician and has served as a computer consultants for the Indonesian Ministry of Health and Ministry of Agriculture.
- Oscar Jubis, MD. Dr. Jubis received his MD from the National University of El Salvador in 1980. He later went to Argentina to develop his speciality in orthopedics and trauma. He worked for eight years for the Military Hospital in San Miguel where he worked with amputees. Dr. Jubis is currently working in the San Rafael Hospital in Santa Tecla and the Santa Teresa Hospital in Zacatecoluca. He also has a private clinic in orthopedics and trauma.
- Danilo Alfaro is a student at the Universidad del Bosco in San Salvador, majoring in Communications. He has worked with the Salvadoran Knights of Malta on the Civilian Amputee Registry with for six months.
- Sonia de Munoz, coordinator for the Knights of Malta's Assistance to Civilian Lower Limb Amputee Project, and Carmen Arguetta, secretary for the Knights of Malta, provided all of the logistical work for the evaluations. They were also responsible for the random selection and notification of the participants for the evaluation.

Telegrams or radio messages were sent to 121 randomly selected lower limb amputees on the Civilian Amputee Registry. These people were requested to go to a Human Rights Center, Knights of Malta Headquarters or hospital in the vicinity on a given date. Although undoubtedly certain unknown biases are introduced in this method of sampling, it was selected over home interviews for various reasons.

- Of the total amputee registry, 25% are mine victims, 45% of whom were amputated within the last two years. Also many amputees live in areas still considered conflictive zones. Therefore, for reasons of safety to the evaluating team, these amputees would not have been included in a field sampling, introducing other biases.

Many areas are somewhat inaccessible because of road conditions and many are off limits because of restrictions placed by the American Embassy Security personnel and their dependents which include the evaluation team leader. Resource and time limitations did not permit training of non-US individuals to cover these areas which are off limits. In addition since response errors caused by memory failure, misunderstanding of questions, and uncertainties about dates, etc. are notorious even on the simplest of survey questions*, it was decided that it would be better to have the same team members participating in each interview.

On the average 15 to 20 minutes were devoted to interviewing each program participant. They were asked a series of questions geared at determining their use of the pylon, the type of activities for which they wore the pylon, problems or discomforts caused by wearing the pylon and the physical condition of the pylon. The participants were also asked how much physical therapy and instructions and exercise for better use of the pylon they received after the pylon was fitted.

Each participant was evaluated by the Dr. Jubis to determine the condition of his stump, possible side-effects related to the use of the pylon, and the ability of the amputee to use the pylon properly.

The amputees who participated in the interviews were compensated for their time and transportation with 25 colones and a kit containing vitamins, aspirin, soaps and elastic bandages.

After tabulating the data, comparisons were made to determine what effect the following factors had on the rate of use of the pylon:

- age
- sex
- the use of a foot versus the rubber tip
- above the knee versus below the knee amputations
- instruction after receiving the pylon

* Sampling for Monitoring and Evaluation. Chris Scott. The World Bank, Washington, D.C., 1985

IV. RESULTS

PARTICIPATION IN THE INTERVIEWS

The original plan was to send out radio calls and telegrams to 200 pylon recipients. However, because of time restrictions, telegrams and radio calls were sent to only 121 amputees.

When the addresses of the randomly selected amputees who had participated in the pylon program were known, telegrams were sent. Radio messages were sent prior to the interviews through local radio stations to those amputees for which no precise address was given in the Amputee Registry. These messages were began three days before the interviews in San Miguel, four days before for San Francisco Gotera, and two days before for Usulután, San Vicente and Zacatecoluca.

The following is a breakdown of the number of people to whom messages were sent and the number who appeared for the interviews.

INTERVIEW LOCATION	MEANS OF CONTACT			
	TELEGRAM		RADIO	
	CONTACTED	APPEARED	CONTACTED	APPEARED
SAN MIGUEL	13	9	7	3
SAN FRAN. GOTERA	7	4	5	4
USULUTAN	13	4	2	0
SAN VICENTE	10	7	2	1
ZACATECOLUCA	2	2	8	3
SAN SALVADOR	52	30	0	0
	97	56	24	11

Twelve amputees who were sent telegrams to appear in San Salvador came a day or more late and were not included in the interview but bring the total who responded to the telegrams up to 68. Thus, the turn out for people sent telegrams is 70% (68/97) and for radio 46% (11/24). One amputee who was sent a telegram had never received a Malta pylon and one had received only a foot to use on a previously-owned prosthesis; neither of these was included in the analysis. Another two amputees who appeared by chance in the interview locations on the day of the interview were included, bringing the total sample size to 67.

GENERAL STATISTICS

Of the 67 amputees interviewed, 52 (78%) had had no prosthesis prior to receiving the pylon from Malta. The others had previous prostheses as follows:

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No.	Source
5	Homemade wooden limbs
5	ISRI (Salvadoran Rehabilitation Institute)
2	Friends, one from a friend who died, one sent from the US and wouldn't fit the friend
1	FUNTER, a Malta pylon given after termination of Malta Program
1	Aparatos Ortopedicos, a commercial firm in San Salvador
1	Received in the hospital

The 52 amputees who received their first prosthesis from Malta spent an average of 5.3 years since losing their limbs with the numbers ranging from 51 years to just a few months. Of the total sample, 52% amputees (27) lost their limbs after 1985 and of these more recent amputees, 59% were mine victims.

Of the total sample, the amputations resulted from:

- 31% (21) - mine
- 19% (13) - gunshot
- 16% (11) - infections
- 12% (8) - traffic accidents
- 7% (5) - diabetes
- 13% (9) - other causes

The age of the amputees interviewed ranged from 11 to 69 with an average of 40 years. The average age of the mine victims in the sample was 38.

Seventy-five percent of the amputees were male and 25% female. Of the mine victims, 81% were male and 19% female.

FACTORS AFFECTING USE OF THE PYLONS

Of the 67 amputees interviewed, 22 were using prostheses provide by FUNTER. These amputees were asked about their use of the pylon before receiving the FUNTER limb and the condition of the pylon when they received the FUNTER prosthesis.

In the following tables, the rates of utilization of the pylons are classified as:

1. Always - the amputee reports that he/she uses the pylon almost continually on a daily basis.

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2. Some - the amputee says that he/she wears the pylon for only a few hours each day.
3. Low - the amputee uses the pylon only two or three times a week.
4. None - the amputee does not use the pylon at all.

A major factor affecting the utilization of the pylons is whether or not the amputation was above or below the knee. Those with above-the-knee pylons tended to use them less than those with below-the-knee pylons. Many reported that the above-the-knee pylons were uncomfortable and awkward.

The percent of amputees with below the knee or with above the knee pylons reporting each rate of utilization is given and the number of amputees in each group shown in parentheses.

TYPE VERSUS USE

Below the knee	Use	Above the knee
80% (28)	ALWAYS	41% (13)
3% (1)	SOME	13% (4)
11% (4)	LOW	34% (11)
6% (2)	NONE	13% (4)
(35)	TOTAL	(32)

Sex appears to have no affect on the rate of utilization of the pylons as shown in the following table.

SEX VERSUS USE

Male	Use	Female
60% (30)	ALWAYS	65% (11)
8% (4)	SOME	6% (1)
20% (10)	LOW	29% (5)
12% (6)	NONE	0% (0)
100% (50)	TOTAL	100% (17)

This similarity in use of the pylons by males and females appears to hold for both above-the-knee and below-the-knee pylons as shown in the following tables.

ABOVE-THE-KNEE AMPUTEES
SEX VERSUS USE

Male	Use	Female
39% (9)	ALWAYS	44% (4)
13% (3)	SOME	11% (1)
30% (7)	LOW	44% (4)
17% (4)	NONE	0% (0)
100% (23)	TOTAL	100% (9)

BELOW-THE-KNEE AMPUTEES
SEX VERSUS USE

Male	Use	Female
78% (21)	ALWAYS	80% (7)
4% (1)	SOME	0% (0)
11% (3)	LOW	13% (1)
7% (2)	NONE	0% (0)
100% (27)	TOTAL	100% (8)

When grouped by age as shown in the following table, it appears that amputees under 20 use their pylons less frequently than other amputees. However, there are only nine amputees in this age group, including two in the "low" use category who had been selected early to receive prosthesis from Project Hope and one in the "none" category who had outgrown his pylons. The 20 to 29 years old age group has the highest percent in the "always" use group but again the sample size in this age group is small. Therefore, a second table is presented which groups amputees as being under 40 or 40 and over.

AGE VERSUS USE

Use	Age (years)					
	< 20	20-29	30-39	40-49	50-59	> 59
ALWAYS	22% (2)	88% (7)	56% (9)	67% (10)	73% (8)	63% (5)
SOME	11% (1)	13% (1)	13% (2)	7% (1)	0% (0)	0% (0)
LOW	56% (5)	0% (0)	19% (3)	20% (3)	19% (2)	25% (2)
NONE	11% (1)	0% (0)	13% (2)	7% (1)	9% (1)	13% (1)
TOTAL	100% (9)	100% (8)	100% (16)	100% (15)	100% (11)	100% (8)

Amputees who are less than 40 years of age appear to use the pylons somewhat less than those 40 and over as shown in the following tables:

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AGE VERSUS USE

Less Than 40	Use	40 and Over
55% (18)	ALWAYS	68% (23)
12% (4)	SOME	3% (1)
24% (8)	LOW	21% (7)
9% (3)	NONE	9% (3)
100% (33)	TOTAL	100% (34)

The small increase in the percent of over-40 amputees in the "always" group holds for both the above and below-the-knee pylons although a higher percent of the above-the-knee over-40 group do not use their pylons at all.

ABOVE-THE-KNEE AMPUTEES
AGE VERSUS USE

Less Than 40	Use	40 and Over
38% (6)	ALWAYS	44% (7)
25% (4)	SOME	0% (0)
31% (5)	LOW	39% (6)
6% (1)	NONE	19% (3)
100% (16)	TOTAL	100% (16)

BELOW-THE-KNEE AMPUTEES
AGE VERSUS USE

Less Than 40	Use	40 and Over
70% (12)	ALWAYS	89% (16)
0% (0)	SOME	6% (1)
18% (3)	LOW	6% (1)
12% (2)	NONE	0% (0)
100% (17)	TOTAL	100% (18)

When the pylons are classified by whether a rubber tip or a foot was used, those with a foot report better utilization of the pylons as shown in the following table. However, in many cases, only tips were offered when the pylon was fitted. Later it was announced that feet were available and that those who wanted could exchange the tip for a foot. It is conceivable that those who were using the pylons less would be less likely to go for a foot thus skewing the data.

TIP OR FOOT VERSUS USE

Rubber Tip	Use	Foot
42% (11)	ALWAYS	73% (30)
8% (2)	SOME	7% (3)
35% (9)	LOW	15% (6)
15% (4)	NONE	5% (2)
100% (26)	TOTAL	100% (41)

In the following tables tip versus foot is also broken down by whether or not the pylons are above the knee or below the knee. For above-the-knee pylons, 63% had rubber tips while only 17% of the below-the-knee pylons had rubber tips instead of feet. In above-the-knee amputees, those with a rubber tip used their pylons far less than those with a foot. This difference did not hold for below-the-knee amputees.

ABOVE-THE-KNEE AMPUTEES
TIP OR FOOT VERSUS USE

Rubber Tip	Use	Foot
25% (5)	ALWAYS	67% (8)
10% (2)	SOME	17% (2)
45% (9)	LOW	17% (2)
20% (4)	NONE	0% (0)
100% (20)	TOTAL	100% (12)

BELOW-THE-KNEE AMPUTEES
TIP OR FOOT VERSUS USE

Rubber Tip	Use	Foot
100% (6)	ALWAYS	76% (22)
0% (0)	SOME	3% (1)
0% (0)	LOW	14% (4)
0% (0)	NONE	7% (2)
100% (6)	TOTAL	100% (29)

At the time of the fitting, each amputee was given some instruction on using the pylon. Some reported that after they were fitted with the pylons they either stayed for a few days or returned later for physical therapy and additional instructions on the use of the pylon. Others stated that even though they had been given an appointment to return or would have profited from additional instruction and physical therapy, that they could not afford to return, both because of the cost of transportation and because of having commitments to job or family. The following tables show the effects of additional instruction and therapy on

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utilization rate of the pylons. Additional instruction appears to have increased the utilization rate of the pylon, particularly for above-the-knee amputees.

INSTRUCTION VERSUS USE

No Additional Instruction	Use	Additional Instruction
57% (24)	ALWAYS	68% (17)
7% (3)	SOME	8% (2)
24% (10)	LOW	20% (5)
12% (5)	NONE	4% (1)
100% (42)	TOTAL	100% (25)

ABOVE-THE-KNEE AMPUTEES
INSTRUCTION VERSUS USE

No Additional Instruction	Use	Additional Instruction
35% (7)	ALWAYS	50% (6)
10% (2)	SOME	17% (2)
25% (7)	LOW	33% (4)
20% (4)	NONE	0% (0)
100% (20)	TOTAL	100% (12)

BELOW-THE-KNEE AMPUTEES
INSTRUCTION VERSUS USE

No Additional Instruction	Use	Additional Instruction
77% (17)	ALWAYS	85% (11)
5% (1)	SOME	0% (0)
14% (3)	LOW	8% (1)
5% (1)	NONE	8% (1)
100% (22)	TOTAL	100% (13)

CONDITION OF THE PYLONS

Overall, the pylons are still in good condition with the most common complaints being the condition of the belts or that the foot, tip, or tube between the socket and the knee has come loose or unglued.

Of the 24 amputees whose pylons still had the rubber tip instead of a foot, five (21%) reported that the tip had become unglued, loose or came off. Among the 22 amputees who had switched from a tip to a foot, only one reported that the tip had become unglued prior to switching. All six of these amputees who reported that the tips became unglued were in the "always" use group who claimed to use the pylons everyday, all day long.

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Seven amputees of the 43 whose pylons had a foot (16%) reported that the foot had become loose. All seven were in the "always" use group.

Four sockets were reported to have been broke, cracked or replaced (6%). These were all below-the-knee pylons in the "always" use group.

The plastic tubing between the sockets and the tip or foot was reported to have become unglued or loose by six amputees, five in the "always" use group and one in the "rare" use group. Another amputee who did not wear the pylon to the interview reported that the tube had broken.

The belt was reported to be unsewn, worn, broken or changed by ten of the amputees (15%). Another ten whose pylons used velcro belts claimed that the velcro no longer stuck. All 20 of these amputees were in the "always" use group.

Twenty-three amputees reported that the sponge in the inside of the sockets was compressed or worn or that they had changed the original sponge or added additional material. Another six reported that they used no sponge or other material in the socket.

Below-the-knee amputees used on the average 2.1 socks with the pylons while above-the-knee amputees used only 1.3 socks.

ACTIVITIES OF AMPUTEES

The majority of the amputees in the sample population are humble country people. The occupational activities of these people changed as follows after their amputations:

- 34% (23) stayed in the same field although the specific jobs which they preformed for the most part changed
- 22% (15) found different work since the amputation
- 19% (13) have been unemployed since the amputation
- 15% (10) were unemployed after the amputation but found work after they received their pylon
- 3% (2) retired after the amputation
- 3% (2) were unemployed both before and after the amputation
- 3% (2) were at some job since the amputation but lost that job after receiving their pylon

Although the actual number of amputees who were able to find jobs only after they received their pylons is low (10), the majority of the people, particularly the below-knee-amputees claimed that work was much easier with the pylon.

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MEDICAL EVALUATION

Dr. Jubis examined each patient interviewed. He reported no permanent damage caused by use of the pylons. He noted some instances where there were protrusions of the bone for which he recommended surgery but these were not related to using the pylon. Many of the amputees reported that they had blisters and sores on their stump when they first began use of the pylons. All treated these lesions on their own and did not seek medical assistance. These problems disappeared with time as the patient became accustomed to wearing the pylon. Many of the above-the-knee amputees who do not wear their pylons or wear them only rarely complained that in addition to being awkward the pylons were uncomfortable or hurt.

In the 45 patients still using Malta pylons, Dr. Jubis recommended corrective surgery for bone or nerve problems in eight patients (six of whom were in the "low" or "none" category for frequency of use and two in the "always" category). He suggested that three other patients be further evaluated for possible surgery and that the fistula be removed from the stump of one diabetic patient. The only Malta pylon user that had lacerations is one of the eight recommended for surgery.

Dr. Jubis reported that six patients walked badly for the following reasons:

- good leg with paralysis
- good leg had polio
- good leg had osteomyelitis
- good foot previously broken
- pain (required surgery on fibula)
- pain in the back (patient not wearing pylon on the day of the interview)

He suggested that five above-the-knee amputees (all in the "low" or "none" frequency of use groups) need additional physical therapy or instruction in proper use of the pylon.

Three of the adult amputees were determined to have pylons which were not the proper length. One felt that her above-the-knee pylon was too long and compensated by wearing a higher heel on her good foot. Two pylons appeared to be too short but in one case, the amputee had decided that his pylon was too long and had removed the rubber tip and shortened the epoxy tubing; unfortunately, he now felt that it was too short and wanted it long again. Dr. Jubis noted an affect in the gait in only one of the three.

V. CONCLUSIONS

SAMPLING TECHNIQUES

Requesting program participants to come to a given location for an interview as compared to actually going to the home of randomly selected pylon recipients may introduce an unknown bias into the sample. For example, one could envision that those who are completely dissatisfied with the pylon may not bother to come, or conversely, those who are extremely mobile because of their pylon may have jobs and commitments which they cannot leave to participate in the interviews. The relatively high turnout for amputees who were sent telegrams (70%) suggests that any such bias in this study may not have been too important. Partially because the lead time for the radio messages was short, notification through the radio was far less efficient than telegrams and only 46% of the people notified by radio participated in the interviews.

The comparatively low turn out in Usulután (31% for those sent telegrams) may be explained in part by the fact that cotton, a principal crop in the vicinity, was being harvested at the time of the interviews. In the area of San Vicente and Zacatecoluca sugarcane is more predominate and was not ready for harvest. Many areas in the department of Morazan are still highly conflictive which make travel more difficult for those amputees requested to go to San Francisco Gotera where 57 % of those sent telegrams appeared. In the western areas around San Salvador where the areas are less conflictive and bus services are much better and less expensive, there was a 81% response to the telegrams (including those who came late).

FACTORS AFFECTING USE OF THE PYLONS

The acceptance rate and utilization of the below-the-knee pylons was high regardless of sex, age, training, and type of tip. Above-the-knee prosthesis were used less frequently, but there were individuals, both male and female, in all age groups who claimed that they wore their above-the-knee pylon continually. Dr. John Michael from Duke University, reported that the use rates for above-the-knee prosthesis - even definitive prosthesis with flexible knees - is much the same as ours and that it is impossible to predict who will succeed with these above-the-knee prosthesis.

According to Roy Snelson, Director of the Orthometrics who designed and fitted the pylons, his studies have shown that the rubber tip used on the end of the pylon is easier and requires less energy to use than a foot. However, he stated that for appearance, most people whom he has fitted, prefer a foot. Our studies agree in that most people said that they also preferred a foot. However, in addition to appearance, many said that with the foot it was easier to walk, that the foot gave them better

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balance than the rubber tip, and because they could use a shoe, the foot was less slippery than the tip. Only one amputee claimed that it was easier to walk with the rubber tip.

CONDITION OF THE PYLONS

The most commonly encountered problem was caused by the tip or tube becoming unglued or the foot becoming loose. Damaged sockets were reported in only four cases. Some had returned to Malta or gone to FUNTER to have the part reglued or tried to glue it themselves. In some cases the parts were still loose and needed to be reglued or, in the case of the foot, tightened.

Both the sponges and the belts are subject to wear. Some people had re sewn the belts or had them remade at a leather shop while other had replaced them with cloth or in the case of velcro belts, simply tied them in a knot. Many had added either sponge or more commonly cloth to the existing sponges inside the socket but no one complained that deterioration of the sponges made use of the pylon difficult nor uncomfortable.

A few people reported that the sockets of the pylons were loose, either indicating improper fit or shrinking of the stump. However, the low number of socks used (1.3 by above-the-knee amputees and 2.1 by below-the-knee amputees) suggests that it is not a major problem.

In summary, the pylons have not yet shown signs of major deterioration. Roy Snelson from Ortometrics claims to have had amputees still using these ready-made pylons after three to four years in Mexico. If provisions can be made to reglue or retightened tips, tubes and feet, the amputees can probably continue using their pylons for some time.

MEDICAL PROBLEMS

Skin problems related to use of the pylons such as lacerations and infections were minor. Many of the amputees experienced blisters and other irritations which did not require medical intervention until they became accustomed to the pylons.

Dr. John Michael, Department Chairman of the Orthopedics department of Duke University, stated that there is no clinical or scientific evidence that long-term use of the pylons damage the spine. He claims that commonly the pylons are made slightly short which may cause a slight limp. However, if the degree of shortness is around 1 cm, there is no problem and that in fact in the normal adult population if the biological legs differ by 1 cm in length, no treatment at all is required. The pylons used in this program are an excellent initial device for new amputees and almost identical devices are used under certain circumstances in the United States. They are typically not used long term.

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primarily because as the limb shrinks, the socket will no longer fit. A useful initial life of the pylons, according to Dr. Michael, is 3 to 12 months after which a more sophisticated device would be better. However, because of the simplicity in design there are people who use similar devices permanently. The pylons require little technology, little maintenance and are relatively cheap to produce. In many parts of India the pylons are the only type of prosthesis available.

A dynamically aligned prosthesis adapted individually to the user fits more precisely than the pylons allowing a more natural gait and enhances mobility. Furthermore the more sophisticated prostheses are more comfortable and can be used in a less conspicuous fashion, but the simple devices do not do any harm. However, regardless of the level of sophistication, prosthesis must be changed periodically as the stump of the individual changes.

It is not easy to train personnel to fit sophisticated devices. In the US four years of college, one year of graduate training and one year of supervised internship is required before a person is allowed to fit prosthesis. Thus, if the use of a simple, relatively easy to fit pylon, is highly efficient as an emergency measure where many amputees are to be provided prostheses in a short length of time.

INITIAL ADJUSTMENT

According to Dr. Flores from FUNTER, the initial adjustment of the Malta pylons was often not done properly with the result that in nearly 50% of the pylon users who he has examined the pylons are either too short or too long by as much as 1.5 inches. He feels that this can and has caused scoliosis and gait problems in his patients. In this evaluation, however, only three adults had pylons which appeared to be too long or too short. Dr. Jubis who examined the patients interviewed in this evaluation did not observe any scoliosis or physical damage in these three individuals.

Although this information from Dr. Flores is recorded in the records of each patient, the data has not been tabulated and thus the exact numbers nor the degree of damage caused is not available. In the monthly FUNTER report prepared at the end of October, of the 152 pylon users listed as having been examined by FUNTER, the following comments were made about the pylons:

- Broken, deteriorated, ruined - 6
- Bothered or caused pain - 5
- Not used - 4
- Loose - 8
- Tight or small - 2
- Short - 1
- Too tall - 3

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Thus, of the 152 pylons 10% were loose, tight, bothered or caused pain, 4% were broken, 3% were not used and only 3% were reported as too short or too long. This report, however, is prepared to indicate the number of patients attended and the treatment given and is not intended as a medical evaluation of each patient. Moreover, as the sample includes people who went to FUNTER on their own because of problems with their pylons, it is not a completely random sample of the pylon users and is biased towards pylons which are not completely satisfactory.

Dr. Osorrio from FUNTER claims that the type of support provided by the socket of the pylon is not appropriate for all types of stumps and should not have been given to some of those who did receive Malta pylons.

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VI. RECOMMENDATIONS

The Third World Leg appears to be an excellent temporary device to enhance the mobility of lower-limb amputees until permanent, more sophisticated devices can be provided. The half-life of these pylons is at least greater than the year to year and a half that they were used in the Knights of Malta's Assistance to Civilian Amputee Program. Certain parts such as the belts and sponges are expendable but can easily be replaced in some fashion by even the most humble beneficiary.

For the most part maintenance is very low, but the rubber tips and the feet do come loose and sockets occasionally crack or break. Some provisions must be made to provide for these minor problems or otherwise functional pylons will not be used. However, for many of the amputees in this country, coming to a center in San Salvador for necessary minor repairs is not a valid alternative. From Morazon and San Miguel, for example, round trip bus fare can be as high as 16 colones - an impressive sum when the average per capita income is only 12 colones a day (based on the 1985 Gross National Product) and where the unemployment rate soars as high as 35% (Ministry of Planning figure for 1987, including open unemployment, disguised unemployment, and under-employment). Nor is it reasonable to provide a mobile unit for pylon repairs since the numbers of pylons at any given time in any given area requiring adjustments is extremely small. Perhaps one possible way would be to train physical therapists or other personnel working in existing medical centers throughout the country to make these minor adjustments which are no more sophisticated than gluing loose tips and tubes with a suitable strong glue or tightening with a standard allen wrench the screw on the bottom of a loose foot.

The acceptance rate as measured by frequency of use of the below-the-knee pylons is remarkably high. Fully 80% of the recipients of the below-the-knee pylons claimed that they used their pylons every day from the time that they got up in the morning until the time that they went to bed at night. Of the six below-the-knee patients who reported that they used their pylons either rarely or not at all, Dr. Jubis recommended surgery to correct the bone or nerves in four. The rate of use for the above-the-knee pylons is not nearly as high, with 47% using the pylon only a few times a week for short periods or not at all. On a purely economical basis, below-the-knee pylons are cheaper and are guaranteed a higher probability of use. Yet, since it is difficult to predict who will use the above-the-knee pylons - there are beneficiaries in both sexes and all age groups who are use their above-the-knee pylons continually - it is strongly recommended that future programs continue to provide both types pylons or other prosthetic devices to all willing recipients.

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The one factor which appeared to have a strong influence on the acceptance rate of above-the-knee pylons is the use of a foot instead of a rubber tip. Although scientific studies may prove that it is technically more easy to walk with a rubber tip, the human factor is obviously important. Feet should, therefore, be offered for those whose pylons still have rubber tips, and future programs should include feet instead of rubber tips unless specific individual characteristics of the recipient indicate otherwise.

Particularly with above-the-knee amputees, physical therapy and additional training in the use of the pylons appeared to increase the utilization rate for the pylons. However, since many recipients expressed that their resources for transportation were limited or that they had commitments to job or family, it is probable that simply scheduling additional appointments after fitting would not be a successful means to provide supplementary training. It might be more effective if at the time of the original fitting, the amputees were give several contiguous days of training before going home.

Children require special attention regardless of the type of prosthesis which they are provided. Obviously, they are going to grow and as they do the height of their prosthesis will need to be adjusted. The capability to adjust the prosthesis must exist in-country and the recipients must be made aware of the permanent physical problems that can develop in a child who uses a prosthesis which is too short. These children must either be periodically checked or their parents must be made aware of what constitutes "too short" and where to go to have the pylons readjusted.

When the pylons begin to wear out or parts such as the sockets or the feet break, replacement parts or another alternative prosthesis should be made available. Since the original "emergency" program to supply a large number of existing amputees with pylons has been completed, it makes little sense to rely continually on pylons being sent from the United States. In-country personnel must be responsible in any case to fit new amputees and to adjust prostheses but would have to rely on materials provided in what is notoriously not a timely fashion from the USA and this supply would undoubtedly sometime be terminated. The development of the capabilities of the Telethon Foundation for Rehabilitation in El Salvador to produce and maintain prosthesis is an excellent alternative. Any additional support for the amputee population should be directed toward further improving and enhancing the abilities of FUNTER in manufacturing and fitting definitive prostheses.

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