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EXECUTIVE SUMMARY

An assessment of needs and potential orthopaedic and rehabilitation interventions in Liberia was undertaken along with Mr. Lloyd Feinburg, USAID/WVF, during an on site evaluation August 5-9, 1997.

There are no current estimates of the number of disabled in Liberia. Reportedly all records were destroyed during the recent civil wars. A January 1994 Liberia Displaced Children and Orphans and War Victims report indicated that the number of disabled children in Liberia ranged from six to 60,000. The Foundation for Rehabilitation of Injured and Disabled estimated 38,000 disabled children, whereas an association of disabled, The Group 77, indicated that there were only 3,000 disabled children in the country. Another agency, the Adventist Relief and Development Agency, believed that the number was closer to 81,000 countrywide. Utilizing World Health Organization's calculations, there could be as many as 200,000 disabled or 10% of the total population. None of these numbers can be verified at this time.

The International Committee of the Red Cross (ICRC) is currently conducting a countrywide assessment to determine the number of amputees in Liberia, and the United Nations Development Programme (UNDP) is reportedly conducting a countrywide survey to determine the total number of disabled. Reportedly the results of these surveys will be available in the near future, and will aid in determining needed rehabilitation services. It is clear that the physical rehabilitation services, prosthetics and orthotics are only a part, and are not available in Liberia. Based on the lowest estimates, there is a large unmet need in the country. Site visits and meetings with agencies and individuals are outlined in the following report.

REHABILITATION SITES IN LIBERIA

GANTA METHODIST HOSPITAL

The hospital was visited by the Office Foreign Disaster Assistance health assessment team in April 1997, but is not reported in their report. Ganta is located upcountry, on the Guinea border, and close to the Ivory Coast (see attachment 1). Ganta is in Nimba County and was controlled by Charles Taylor. It was not severely damaged during the civil war, although the Methodist hospital was reportedly looted. Currently medical services are limited.

The trip to Ganta required a three-hour plus drive at breakneck speeds. The majority of the road is in good condition. The countryside in route is noted to be very green with heavy forest, and the land appears to be very fertile. Rubber plantations appear to be well-organized in much of the area, but little activity regarding harvesting appeared to be ongoing. Personnel traveling with us estimated that rubber production in the country was only at about 25 percent of capacity. Most all the permanent concrete type buildings en route have been burnt out or stripped. Buildings in the area of Ganta appeared more intact. Road traffic was limited. There were a few overloaded trucks transporting people and goods and a few "yellow cabs" seen transporting passengers.

On arrival in Ganta, we went directly to the Methodist Hospital and were met by the medical director and Mr. Neston Sual, the chief orthopaedic technologist. The Ganta Hospital is a series of interconnected one-story concrete structures. The hospital was supposedly looted during the war, and only basic services are now available.

The medical director reports that the hospital is severely understaffed and that prior to the war, there were seven physicians on staff and now only three remain. There are 22 nurses normally on staff, but now only 13 remain. The hospital can provide for 65 inpatients with emergency expansion to 75. The medical director, the only surgeon, provides some of the orthopaedic care, but special cases requiring more complex orthopaedic procedures requires that an orthopaedist, Dr. Kpoto, come in from Monrovia.

Discussions with the medical director revealed that he had no x-ray film, and he was going to drive to Monrovia to see if he could find any. He has limited suture material and has no plaster-of-Paris bandages to treat fractures. They report that gypsum is unavailable in Liberia, and so all plaster must be imported. I spoke with the medical director and asked how he treated fractures

without plaster, and he replied that he used aluminum splints when available. Long-bone fractures of the lower extremities would require some form of traction. When I specifically asked his method of managing femur fractures, he stated, "A week or so in traction, then a splint." This would be difficult to do, but there don't seem to be many options. He also stated that he does open reduction internal fixation of fractures, but the last patient he had plated had not returned to have the screws and plates removed, and therefore, he had none that he could use on anyone else. Implants used on one individual are never reused in the developed world.

I asked if he or his colleagues had treated new polio. He stated that last year he saw a child who had had polio a few years before. The incidence of new polio in Liberia cannot be documented. I asked about amputations. And the surgeon estimated that he had done 20-25 amputations since 1990. This is a low number considering wartime conditions.

The orthotics department was reportedly looted. This must have occurred sometime before 1994, in that I spoke with Dr. Tim Staats, and he indicated that on his 1994 visit, orthotic-prosthetic services were extremely limited at that time due to the loss of equipment and materials.

It is unclear what happened to the building where the workshop used to be located. Currently the workshop is located temporarily in a nursing education area. This approximately 15 x 30 foot space has four to five work tables. There is no other equipment visible. Interestingly, new bench vises have been attached to each of the tables, but there is no evidence they have ever been used. This picture is the same as described by Dr. Staats on the occasion of his 1994 visit.

There are four orthopaedic technicians in Ganta. Three were trained in the Tanzania training school, TATCOT, and one received six months training in Brazil (see attachments 2 and 3). Very limited fabrication is reported by the orthopaedic technicians. Apparently all work is done at a nearby leper-treating hospital. We were unable to visit that treatment center, and it is not reported in the April 1997 health assessment.

Mr. Sual produced a list of approximately 125 individuals waiting for prosthetic-orthotic services. This list was about 50/50 orthotic vs. prosthetic patients. Some were individuals injured during the war, while others were reported polio victims.

A new prosthetic-orthotic workshop was proposed some time ago and was going to be housed in an unfinished vocational school constructed from concrete block. The doors and windows had not been framed in, and electricals and plumbing had not been installed. The roof was incomplete in several areas. The building is also below grade and floods with heavy rains. The layout of the rooms is inappropriate for a prosthetic-orthotic workshop. Dr. Tim Staats, who toured the site in 1994, had recommended the plans for this renovation be abandoned, and I concur with that recommendation (see photographs 1, 2 and 3).

Drawings of a proposed new workshop were presented to us (see attachment 4). A contract for

its construction has been awarded, and land is currently being cleared. The site is near the other hospital buildings. The plans for the workshop do not provide for a good working condition. Fabrication space and patient waiting areas are mixed together. The drawings do not indicate any water in the building, except for the lavatory area. Proposed changes to the layout are indicated in attachment 5.

A very complete list of supplies and equipment was provided by Mr. Sual. We were unable to copy this list, and unfortunately it was not available in the UNICEF office. Catalogs for the most expensive European tools were utilized to develop this list. Future purchases should be reviewed by a paid consultant.

Some equipment and supplies have been requested through the Copenhagen office. The purchase list shown me does not represent realistic pricing, i.e., \$35 U.S. for a pair of pliers and \$78 U.S. for a band saw. I was told that the Copenhagen office would request bids for these items from several sources, prior to purchases being made.

Included in this report is the ISPO *Planning and Installation of Orthopaedic Workshops in Developing Countries* manual (see attachment 6). This manual will help in planning a workshop. It includes layout, equipment/supply lists and an organization plan.

To insure technical staff meet recognized standards, the ISPO Information Packet for Category II Professional Orthopaedic Technologists is included, along with the profile for a category I prosthetist/orthotist. See attachment 7.

BENEDICTINE MENNI REHABILITATION CENTER FOR CHILDREN

This facility was once operated by the Hospitaller Sisters of the Sacred Heart of Jesus. They provide rehabilitation services to children (see photograph 5). The 1994 report describes the services that were provided. The center was reportedly abandoned during the war and has not been reopened. There is no indication that the sisters will return. There is limited damage to the structure, windows and doors were removed, but bed frames, light fixtures, fans, etc., remain.

The old prosthetic-orthotic workshop has one electric prosthetic-orthotic carver and a large oven in place. There is no apparent damage to this equipment. No other tools, supplies or equipment was seen. In the workshop area, there are a considerable number of used prostheses and some unused prosthetic components. The overall majority of these used devices and components are for adults. I am unsure where they came from, but there is little here that would be used on children. Photo 8.

The physical therapy area is intact with some of the equipment for different modalities still in place. See photographs 9 and 10. It is difficult to know what was looted and what has been

stripped for parts. Some wall outlets have been removed, others untouched. Electric lights and overhead mounted fans are in place. See photograph 11.

JOHN F. KENNEDY HOSPITAL

This very large hospital complex is basically abandoned. There are some outpatient medical and maternity services being provided on one of the first-floor sections of the hospital. We were introduced to the director of medical engineering, Mr. John Matthews, who conducted a tour of the accessible areas. Parts of the hospital are closed off and cannot be inspected.

The former prosthetic-orthotic workshop is abandoned with some prosthetic-orthotic equipment still in place. A Troutman carver, disk sander, buffing machine and drill press all appear operational, but there is no electricity available to test them. See photograph 12 and 13. The facility was last used in 1989, and no records or information are available. Former employees of this institution have started a new corporation and have applied for funds. A report of the National Orthopaedic and Rehabilitation Center is included.

We walked through the generator and boiler areas of the hospital and noted that all the pieces of heavy equipment were damaged or parts had been scavenged. There was power to one of the ground floor areas, but this must have been through a temporary generator system.

There are stacks of medical equipment all over the place. See photograph 14. Some appear operational, while others have obviously been scavenged for parts. Everything is mixed together and it is virtually impossible to make any sense of the piles of equipment. Orthopaedic and Neurosurgery Cerca Electric beds and Stryker frames were mixed with other bed frames, etc. See photographs 16 and 17.

The medical repairman stated that some of the piles of equipment were received from donors in the United States. They are now a mixture of rusted parts and broken components. He stated this is the condition in which much of it was received. Some of the equipment is being refurbished and stored, but it is difficult to tell what is what. There is certainly potential for this equipment to be refurbished, salvaged, and placed back in service.

We were taken into the old physical therapy area. This area was locked and secured with several workers in the immediate area. The therapy area appears to now be a storage area, containing a mixture of items. Included were several large bags of powdered milk. Due to the dampness in the room, several of these bags had spoiled. Physical therapy equipment and hydro equipment were still in place and appeared in good condition. See photographs 18, 19, 20, 21 and 22. There were two large stainless steel Hubbard tanks outside on the lawn. See photograph 23.

NATIONAL ORTHOPAEDIC AND REHABILITATION CENTER

This organization was founded by former employees of the John F. Kennedy Hospital, and in 1996, submitted a proposal to ICRC (Monrovia) for funding. See attachment 8. This organization includes a technical staff of 18 and an administrative staff of 5. They intend to be a non-governmental, not-for-profit institution.

We visited their offices which now appear as a storefront operation. See photograph 24. In front of the door were some old worn out braces and artificial limbs received and marked as gifts from the Worldwide Lighthouse Mission, in the United States. There was a large stack of these used devices in one area of the "workshop." These are devices that were fabricated for someone in the United States. Some show that they were extensively used and others appeared unused. There is little that can be done with these devices. It would be difficult to salvage components, and there was no indication that any attempts to salvage parts were underway.

The office consists of a narrow U-shaped room with one low bench in the middle of the small main room. There was a carpenter's tool box on the floor, but no tools or equipment commonly used in prosthetics or orthotics were in evidence. There was no work in progress, and these technicians indicated that it had been some time since they had seen a patient or delivered a device.

There really isn't anything further to report from this group. It exists, but due to current economic conditions, lack of supplies, etc., it will be difficult for any private group to survive in Liberia.

GROUP 77

This is a consumer group organized by a past vice president of Liberia. They were organized in 1977 and reportedly have a disabled membership of over 500 at this time. There were approximately ten ambulatory disabled in the immediate area. All the disabled I saw could be orthotic users. None had any form of orthopaedic device. I asked their leader what his membership required. He asked for training, so that they could get jobs. I specifically asked about their needs for orthoses or prostheses, and he stated that they all had gotten along so long without anything that jobs were a higher priority.

One gentleman using crutches stated he had polio at a young age, and asked if bracing would help him. A single knee-ankle foot orthosis would have permitted him to be independent in ambulation and would remove the need for the use of crutches. I asked the group assembled in this office about polio. They indicated that a number of their membership had had polio but were unaware of many new cases involving children.

THE CENTER FOR REHABILITATION OF THE INJURED AND DISABLED

Dr. Robert M. Kpoto is the executive director of C.R.I.D. See attachment 9. Dr. Kpoto is the only recognized orthopaedic surgeon working in Liberia at this time. Many of the NGOs that we spoke with referred to Dr. Kpoto. He has a good reputation and is well-respected by all with whom we spoke. He reports doing voluntary work with several groups. The NGOs I spoke with indicated that they recognize that he is very competent but also expensive.

Dr. Kpoto indicated to me that his real love is rehabilitation, and if he could, he would gladly give up surgery in favor of running a rehabilitation service. I am unaware of any specific training he has had regarding rehabilitation services. Dr. Kpoto reported he is working with the UNDP to conduct a countrywide disability survey. He stated that the results of the survey will be available shortly.

I spoke with Dr. Kpoto about new cases of polio in Liberia, and he stated he had not seen new polio for some time. There may be new polio, but possibly the children do not survive the acute phase. This opinion was supported by other NGOs that we spoke with.

INTERNATIONAL COMMITTEE OF THE RED CROSS (ICRC)

A luncheon meeting was held with Mr. Jurg Wenger, a health delegate working in country to conduct a countrywide survey of amputee needs. The survey is being circulated at ICRC food distribution projects. There is no indication of what action ICRC may take, and there are no preliminary results regarding this survey. We asked Mr. Wenger his impression of the incidence of polio, and he indicated it was not an area that he was looking into, but he had seen some polio victims but didn't think new polio was a pressing issue.

OVERALL IMPRESSION

There is a countrywide need of all forms of medical services. All the hospitals have suffered as a result of the war. The physical structures do not appear severely damaged, but there is considerable damage done to the physical plants providing electricity and water. The country is basically without electricity and telephone communication. All medical services provided in the country at this time appear to be at a very basic level. There must be a very high mortality rate for anyone with significant injuries or illnesses due to the lack of equipment and supplies.

The number of physically disabled that we saw in the general public was very limited. In the three days of driving around Monrovia and to Ganta, no more than four amputees were seen and ten potential brace-wearers. There was some concentration of disabled in one of the market areas and Dr. Kpoto's office. I was told they were there primarily begging. I saw no one using either a prosthesis or orthosis.

Due to the conditions in the country and its history of conflict, there must be significant numbers of disabled. It is obvious that there are no facilities in the country providing rehabilitation services that include prosthetics and orthotics. Unlike other developing countries, Liberia does have a corps of individuals appropriately trained in prosthetic-orthotic services. These orthopaedic technologists and technicians now lack tools and the supplies necessary for prosthetic-orthotic production. They may also need upgrade training due to the length of time since graduation from school and they have done so little prosthetic-orthotic production in the last several years.

Some of the heavy equipment needed in prosthetic-orthotic production is available but sits idle in abandoned facilities. With the exception of a band saw and some sanding equipment, most all the big pieces of equipment are available in the abandoned prosthetic-orthotic workshops. None of the hand tools required are in evidence.

The JFK facility and the Benedictine Menni facility could be made operational with much less money than it will require to start a completely new facility. Neither one of these facilities is located near a functioning hospital, and that is the only drawback to reestablishing prosthetic-orthotic services at these sites.

Rehabilitation of the amputee and patients with neuromuscular disorders is best accomplished by utilizing a team approach. Right now there is not a team in place anywhere in Liberia dealing with physical disabilities. Historically the physician is the team leader, but this is not a requirement. The physician must initiate the prescription for the orthoses or prostheses and ensures that the device provided meets the needs of the patient. The physician will also direct any of the therapies that the patient receives.

I am not sure there is a physician in Liberia who has the necessary training required to direct a rehabilitation service. I am also told that there are no qualified physical therapists in Liberia at this time. The effectiveness of delivering appropriate prosthetic-orthotic services will be severely compromised unless there are physicians and therapists available who can participate in team decision-making. Upgrade training of professional and technical staff will be a requirement if appropriate prosthetic-orthotic services are to become a reality. Their overall knowledge and skills will need to be assessed. This may require that an expert like Mr. Harold Shangali, principal of Tanzania Training Center for Orthopaedic Technologists (TATCOT) (for address, see attachment 10), review the capacity of available technologists and technicians. Short courses could be organized for training prosthetic-orthotic staff, so that when facilities, equipment and supplies are available, work will not be interrupted. A series of short courses could be given at TATCOT or provided on site by ISPO. Further information about ISPO educational programs should be directed to Professor John Hughes. See attachment 10.

A professional who is knowledgeable about the delivery of rehabilitative services will be required for the full potential of this grant to be realized. An expert in prosthetic-orthotic delivery needs to advise UNICEF in the establishment of this workshop, the purchasing of equipment and tools, and to assess the delivery of prosthetic-orthotic services. The assessment of these services should be an ongoing project and may necessitate an on-site inspection two to three times a year. I would recommend an ISPO category I prosthetist-orthotist with working experience on the African continent as most appropriate. See attachment 10.

If a workshop is established in Ganta, transportation to and from the center is going to become a major issue. Public and private transportation is very limited, and I assume the patients will have very limited resources. Some form of transport or vouchers for transport will need to be developed. Patients who travel great distances will require some form of hostel accommodations for them and family members traveling with them.

RECOMMENDATIONS TO UNICEF - LIBERIA

1. Obtain a reliable countrywide assessment of people with disabilities and their geographic distribution.
2. Identify and complete an inventory of available prosthetic-orthotic equipment in country.
3. Acquire the services of a professional with a background in rehabilitation services.
4. Contract the professional services of a qualified category I prosthetist-orthotist to advise and monitor the prosthetic-orthotic services provided.
5. Develop a priority list for those to receive prosthetic-orthotic services.
6. Establish a prosthetic-orthotic production facility.
7. Develop a patient referral system that provides needed transportation, corrective surgeries, medical treatment, and rehabilitation training.
8. Provide upgrade training for those providing rehabilitation services.
9. Provide basic training for those involved in rehabilitation services who have not previously received specialty training.
10. Monitor production numbers closely and the expenditure of supplies and materials. Avoid inappropriate use or loss of prosthetic-orthotic materials and supplies.
11. The United States must get appropriate recognition for its humanitarian assistance. There is no evidence that any of the assistance being provided is a result of a grant from the United States and its taxpayers. The USAID logo should appear on everything purchased with these monies.
12. Those monies coming from the United States should be utilized to purchase American products.
13. Until reliable numbers of disabled are available, it will be impossible to establish realistic component production facilities. Immediate needs should be met by utilizing prefabricated prosthetic-orthotic components purchased through the United States.
14. If sufficient numbers of prosthetic-orthotic component needs can be identified, it may be economical to establish in country production facilities. This could be in the form of a cottage industry. A cottage industry could be expanded to provide regional services if the need is determined.

PHOTOGRAPHS

Photo 1. An exterior view of the once proposed prosthetic-orthotic workshop

Photo 2. Inside view of the proposed workshop. This construction consisted of cinder block interconnecting rooms, and the layout is inappropriate for prosthetic-orthotic production facilities.

Photo 3. An inside view of part of the area with unfinished roof.

Photo 4. The site of the proposed workshop in Ganta. Ground is now being cleared with the intent to start construction of a building in the very near future.

Photos 5 and 6. A sign leading to the Benedictine Menni Rehabilitation Center. This center is somewhat difficult to get to in that the road is very rough and unfinished. Note the power lines in the background. See photograph 6. Wire carrying electricity has been removed.

Photo 7. Outside view of the Benedictine Menni Rehabilitation Facility. The buildings are intact with no exterior damage.

Photo 8. The prosthetic-orthotic facility at Benedictine Menni. The prosthetic carver against the right-hand wall is still intact and should be operational. The large gray-appearing cabinet in the middle is actually a large oven for heating plastic. The majority of prosthetic-orthotic devices in this picture are actually for adults. This is somewhat confusing in that the center took care of children. There are a number of prosthetic feet and ankle set-ups in this picture and could be used in prosthetic production.

Photo 9. View in the physical therapy area. Note the bed and treatment table. All the glass from the windows has been removed.

Photo 10. Physical therapy treatment area with frames attached to the walls and ceilings to aid in setting up patient in prolonged passive stretch or pulley systems to be used to facilitate progressive resistive exercises.

Photo 11. This is the inside view of the nuns quarters, which has also been looted. All that remains are bare bed frames, but electrical outlets, light fixtures and fans are still in place. The

figure on the wall is made from cutouts of paper and was not damaged during the looting.

Photo 12. Inside view of the prosthetic-orthotic workshop at J.F.K. Power equipment is still in place and apparently still operational if electricity is provided.

Photo 13. Odds and ends of prostheses and splinting equipment. The table is the remains of a heavy duty industrial type sewing machine that has been looted. None of this equipment or these parts appear to be of much value at this point.

Photo 14. Outside view of the J.F.K. Hospital. This area is apparently the receiving area of the hospital, where medical equipment and bed frames are stacked in unorganized piles.

Photo 15. More medical equipment which includes an operating room light and laboratory equipment. None of this material appears operational.

Photo 16. This large, open hallway is on the ground floor of J.F.K. Hospital. The table in the middle is a Stryker fracture table that appears to be intact. Behind that is a tilt table used to help get patients upright, and behind that an incubator for a nursery.

Photo 17. More bed frames.

Photo 18. Inside the physical therapy area of J.F.K. Hospital. This is a hydrotherapy treatment unit with a mechanical lift for managing the patient. The equipment appears to still be operational. The material in these boxes was not identified. The white bags on the floor contain spoiled dried milk product.

Photo 19. Inside the physical therapy area. The equipment near the windows is sterilizing equipment that appears to be operational. The two chairs that you see with the yellow tags are donated from the Lighthouse Mission. These chairs appear to have been well used prior to shipment. The paper bags contain dried milk.

Photo 20. J.F.K. physical therapy storage area. More equipment stacked in boxes; plaster-of-Paris bandage in many of these boxes. The physician in Ganta indicated he had no plaster for treating fractures. This room is damp, and it won't be long until this plaster is no longer usable.

Photo 21. Mattresses and unidentifiable medical equipment stacked in boxes. A shoulder exercise wheel is mounted on the wall behind the boxes.

Photo 22. Individual treatment cubicles at the J.F.K. physical therapy department, now with just supplies stacked.

Photo 23. Two stainless steel Hubbard tanks left outside.

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Photo 24. The storefront operation for the National Orthopaedic and Rehabilitation Center. These four individuals are reported to be prosthetists-orthotists. The devices on display in front were received from the Worldwide Lighthouse Mission. These devices were donated to the center for reuse. There is no evidence that any effort has been made to salvage components.

Photo 25. Used prostheses and orthoses. Some parts may be salvaged. They are useless as they are.