

## **Observations of Rehabilitation Service Provided in Nepal**

An assessment of current rehabilitative services provided in Nepal was undertaken May 11-15 2004. The team consisted of Cathy Savino and Mel Stills from the Leahy War Victims Fund. Due to political unrest and scheduled "bandh" the team was restricted to their hotel on May 11-12. Permission from the RSO was not gained for the scheduled visit to the Green Pastures Hospital in Pokhara, Nepal on May 12, 2004. Attempts to reschedule our trip to Pokhara were unsuccessful. Because of the "bandh" access to other sites and/or individuals was severely limited due to restriction of motor vehicle travel in or around Kathmandu.

### **ICRC Visit**

A brief visit was arranged in our hotel with the Medical/Surgical Director of the ICRC Mission in Nepal on Wednesday, May 12, 2004. He indicated, based on an assessment carried out by Peter Potsma, ICRC Prosthetist/Orthotist, that the ICRC polypropylene prosthetic technology should be introduced in Nepal. Green Pastures Hospital was selected as the site for introduction. Mr. Renner Knoll, ICRC P/O, is currently on site in Pokhara. He will be onsite for another 2 ½ months then will depart and return again in September/October 2004. Several attempts were made to call Mr. Knoll over a two day period but were unsuccessful. Dr. Avogadri indicated early on in our discussions that there is little evidence of actual land mine injuries in the Nepal, rather he indicated that controlled detonation devices were being used, generally around military barracks and installations. The injuries sustained are similar to landmines but are not due to accidental detonations.

The number of war related injuries is not known and there are little statistics for the general disabled population in country. Some literature guesses that it is nearly 5%. Dr. Avogadri indicated that he believed that medical/surgical services in the Kathmandu area were at an appropriate level. Services at the district level were less than desirable. A government level insurance is provided anyone injured as a result of conflict. That insurance continues for three months from the date of injury. ICRC has assisted those individuals whose injuries have not been resolved in the three months insurance period.

Because medical/surgical services and prosthetic/orthotics services are currently provided at a level above what is normally seen in a country in conflict the question was asked, what is ICRC's role in Nepal? Dr. Avogadri indicated that he was providing emergency first aid instruction at the district level and that ICRC was addressing issues related to transport of injured and those requiring med/surg/rehab services. The question of why ICRC prosthetic technology was being introduced appears to be related to standardizing components and the use of thermoplastic materials.

In order to make up the lost time imposed by "bandh" it was decided to combine our visits to the Children's Hospital and the Leprosy Mission into the same day, freeing up another day to drive or fly to Pokhara. We were under the assumption that permission was given. Our visits to the Children's Hospital and the Leprosy Mission would not have been as hurried if we had know that the RSO in fact had not given permission for our travel.

### **Hospital and Rehabilitation Centre for Disabled Children (HRDC) 5-13-04**

This center was visited on Thursday May 13. This Centre is located 25 km east of Kathmandu. In an area called Janagal, Banepa, on 9 acres of property situated on top of a ridge. It is a 68 bed facility with 10 visiting doctors, surgeons, and consultants. In-patient services are limited up to age 16 with some extended to age 18. 16,000 children have been treated to-date. Surgical services are limited to two days per week with the remaining three days devoted to out patient services. Diagnostic treatment groupings are as follows:

- Club foot            19.23 %
- Polio                    13.5 %
- Burn                    9.82 %

- Osteomyolitis 2.91 %
- TB 2.94 %
- Trauma 12.4 %
- Other 39 %

It is interesting to note that “other” is the major group which is an indication of the complexity and variety of cases seen at this center.

The Centre also has a very complex CBR program covering 50% of the country. This program is used to identify and refer cases for treatment. There are 3-4 mobile camps also established. This CBR program appears well organized.

A cost recovery program has been implemented for all services provided.

The orthotic and prosthetic service is staffed by the following:

- Two O&Ps trained in Peshawar Pakistan
- One O&P trained by Mobility India
- One trained Technician
- One Leather Worker
- Two Assistant Leather Workers
- One helper

The Orthotic Department was well equipped and adequate space appears to be provided. The power equipment used in prosthetic/orthotic production is of good quality, Otto Bock, and everything is reported to be operational.

There is no evidence that a prosthetic service is provided. The majority of services appear to be lower limb orthotics, shoes, and some spinal orthotics. Some thermoplastic orthotic services are provided but the majority of orthotic services appear to be of metal and leather.

Orthotic metal components for AFO's and KAFO's are purchased through ALIMCO in India. There may be a local distributor in Kathmandu but they indicated their inventory came from India directly. Because of time delays in paying purchases and shipment a minimum of six months is allowed for delivery. At present time an adequate inventory of metal components are on hand.

There is a limited supply of thermoplastic materials on hand and they indicated that what they have was donated from a group in Germany. Only one molded plastic KAFO was seen on a patient and at a distance it appeared to fit appropriately. There were discussions with O&P staff about the incorporation of ankle joints to provide greater functional outcomes.

Staff indicated that orthotic services were provide only after an order for services was written by a physician. The prescription is not specific to what should be provided but generally only indicates that an orthoses is to be provided. There are no team meetings or a team approach in determining rehabilitation services. The role of the patient or their family in determining treatments was not determined.

Ward rounds were interesting in that a number of external fixation devices were observed for fracture fixation and correction of deformity. Questions of the nursing staff as to lengthening procedures and pin tract care indicated that they are well trained. Patients were also noted to be hanging in balanced suspension for fracture care. All treatments observed appeared appropriate.

A visit to the Physical Therapy area revealed a sparsely equipped department. None of the exercise equipment or modalities common for pediatric services were seen. The PT Department is not well lite so it appears dark and not a place of recovery. The staff we met appeared competent, up beat, and confident. Several small children/infants were being treated for clubfoot deformities. Serial casts and/or posterior splints were being used. Management methods appeared appropriate. Interestingly they have child size

walkers made using only bamboo. These are well made and truly incorporate the concept of appropriate technology and use of local materials. The only suggestion might be the addition of some rubber on the end of the legs to reduce the noise levels the children seem to delight in producing.

#### The Leprosy Mission (Anandaban Hospital) 5-13-04

The team met with Dr. Mark Macdonald who is the Medical Superintendent and Reconstructive Surgeon. Dr. Macdonald received his Orthopaedic training in New Zealand and has worked at the Leprosy Mission for the past eight years.

The most of Dr. Macdonald's surgery is soft tissue reconstruction. Due to the nature of leprosy there is need for upper limb reconstruction which involved muscle and tendon transfers in order to restore hand function.

The Hospital/Mission is located to the far south of the city of Kathmandu in the Anandaban district of the city. There are eight Medical Staff and 20 Nursing Staff. The Hospital provides medical/surgical support to the surrounding community as well as a referral center for leprosy in the central section of Nepal. The Mission also has a major role it plays as a research center for the treatment, diagnosing and prevention of leprosy. A key area of research is the development of a skin test for diagnosing the disease. This work is being done with the collaboration of the University of Colorado.

This Mission has a 45 year history in Nepal. Leprosy has a high incidence in Nepal, 5 per 10,000. Country wide there are some 7,500 new cases and approximately 100 new cases are treated at this leprosy mission. A direct correlation has been found between persons living in poverty and those contracting leprosy.

The Leprosy Mission has a 125 bed hospital. 250 reconstructive procedures are performed each year. Five to six amputations are performed each year at the Mission.

Mr. Sharran Ruchal is Director of the P&O Department. He received his training in India and has worked at the Mission for 23 years. He has also been trained as an anesthetist and works two days a week in the surgical department. His services include regional, spinal and general anesthesia. Mr. Ruchal understands well anatomy, indications for surgery, and the surgical procedures to be performed.

The prosthetic/orthotic services were established in 1984. Current P&O facilities are very small and poorly equipped. There are some 150 amputees in the system at this time. 1500 patients are wearing special shoes manufactured in the P&O Department. Shoe production for leprosy patients is the major activity for this department. Approximately 24 prostheses are manufactured per year. They are currently producing laminated prosthesis and the overall majority was the transtibial (TT) design. Amputation above the TT level is not common to the leprosy patient.

Only one TT prosthesis was observed. It contained normal socket shape and had a soft removable liner. The cosmetic appearance of the prostheses appears good. The trim lines of the socket appeared appropriate and the edges were smooth.

The life expectancy of the prosthesis is estimated as 5 years. The Jaipur foot has been used but was found to be not flexible enough. As a substitution they are making a pine foot with cushioning added under the heel. The wooded foot is not articulated and is totally rigid so something has been lost in the translation. This foot design will not provide good function and will not last long.

High density polyethylene drain pipe material is cut to the appropriate length then cut length wise. The material is heated and forms a flat sheet of plastic that can be drape molded of a plaster cast. This was being done to make ankle foot orthoses that are static positional devices.

Dr. Macdonald performs 10-12 Posterior Tendon Transfers in order to restore foot dorsiflexion per year. This procedure is done because he believes that molded plastic AFO's can not provide a functional alternative to the surgical procedure. Total contact AFO treatment of isolated dorsiflexion dysfunction is common and upgrade training to the orthotic staff would reduce the need for this surgical procedure.

Ward rounds revealed a number of patients with the diagnosis of leprosy undergoing ulcer treatment of the foot. Staff prefers the term ulcer treatment rather than "wound treatment" which is preferred in North America.

We visited the Research Department and were given information on their work in development of leprosy diagnostic tests.

Overall impression given by observation and discussions with Dr. Macdonald and his staff was of a competently ran Mission/Hospital, doing good work. Upgrades in the P&O Department would aid the Hospital being able to accomplish their mission at a higher level.

#### International Nepal Foundation (INF) Phillip McMillan

INF was formed in 1954 and is a faith based NGO. The expatriates working for INF at Green Pastures are responsible for raising funds for their own support. No salary is drawn from the organization. While faith based their mission is not to evangelize. Their original mission was leprosy treatment and it remains a large portion of their activity. They have also taken on the role of a spinal injury treatment facility. Mr. McMillan states that the power of prayer has had remarkable results in returning SCI to walking status.

The prosthetic technology Green Pastures are using involves the use of plastic drain pipe. Mr. McMillan was unfamiliar with the term Mohavier or Jaipur. He indicated that the use of plastic drain pipe was developed by Dr. Alison Anderson, Technical Advisor and Biostatistician, and an engineer from the UK. Part of their motivation was cost savings. Since we could not visit this site and talk with the ICRC Prosthetist we are unclear as to what technology is being used. ICRC recommendations were to introduce PP technology.

If they are cutting the plastic pipe and heating till flat then forming a well fitting socket and addressing proper prosthetic alignment, what they are doing may be appropriate but if they are fabricating prostheses using the Jaipur drain pipe method then the appropriateness of their service may be in question. Email communication with ICRC will be undertaken when we return to the USA.

#### Recommendations:

- Upgrading of orthotic services in the Children's Hospital and the Leprosy Mission is indicated in the use of thermoplastic materials.
- Upgrading of pediatric physical therapy modalities is indicated at the Children's Hospital.
- Addition of pediatric playground equipment to be used in conjunction with therapeutic sessions is indicated at the Children's Hospital.
- Upgrading of workshop space at the Leprosy mission to permit the appropriate fabrication of thermoplastic total contact orthotic systems.
- Encourage collaboration with volunteer organizations such as Health Volunteers Overseas (HVO) to aid in upgrading surgical, therapeutic, and orthotic services.
- Aid Green Pastures in upgrading P&O services and associated physical therapy programs.