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**World Health  
Organization**

REPORT  
OF A  
**CONSENSUS CONFERENCE  
ON APPROPRIATE LOWER LIMB ORTHOTICS FOR  
DEVELOPING COUNTRIES**

HANOI, VIETNAM  
3-8 APRIL 2006

EDITED BY  
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AND  
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## **ACKNOWLEDGEMENTS**

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The Society undertook the arrangements for the conference.

The Vietnamese College of Orthopaedic Technology (VIETCOT) provided the local organization in Hanoi which the organisers gratefully acknowledge.

The Organizing Committee thank all the presenters and participants for their active contributions throughout the conference.

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## **PART 1**

### **Organisation and outcomes**

## **Background**

### **Nerrolyn Ramstrand and Norman A Jacobs**

The Consensus Conference on Appropriate Lower Limb Orthotics for Developing Countries follows on from the Consensus Conferences on Appropriate Prosthetics for Developing Countries held in Phnom Penh, Cambodia in 1995 and Appropriate Orthopedic Technology for Low-Income Countries held in Moshi, Tanzania in 2000.

The purpose of this conference was to pick up from some of the topics identified in the two previous conferences on orthotics in the developing world and in particular, orthotics related to the lower limb. The conference covered the lower limb orthotic management of poliomyelitis, clubfoot, trauma, stroke/traumatic brain injury and feet lacking protective sensation.

Once again this conference was organized by the International Society for Prosthetics and Orthotics (ISPO) in collaboration with the Leahy War Victims Fund of the United States Agency for International Development (LWVF-USAID) and the World Health Organization (WHO). The local organizers were VIETCOT/GTZ.

The meeting was attended by representatives of all the major agencies involved in the provision of lower limb orthotics services in the developing world and ISPO, LWVF-USAID and WHO are grateful for the input that they made in presenting background papers and the contributions they made in the ensuing discussions.

This publication reports on the work of the conference and contains the background papers and the discussions on them, detailed reports of the syndicate discussions on selected topics, the resulting plenary discussions, and the final conclusions and recommendations.

ISPO appreciates the efforts of all the people involved in this meeting and hopes that this report of this conference goes some way to help improve the lower limb orthotics services in developing countries.

## **Opening ceremony**

### **Mr Harold Shangali, President ISPO**

Mr Chairman

Representative of the Leahy War Victim Fund, USAID: Mr Rob Horvath

Representative of the World Health Organisation: Mr Chapal Khasnabis

Representative of MOLISA: Dr Dam Huu Dac

Representative of the Ministry of Health: Mr Tran Trong Hai

Representative of the German Agency for Technical Cooperation: Mr Guenter Rietmacher

Chairman of the Conference Organising Committee: Dr Bakht Sarwar

The US Ambassador to Vietnam: Mr Michael Marine

Distinguished Participants and Guests

On behalf of the International Society of Prosthetics and Orthotics, and myself, I wish to extend a word of thanks to all of you and, in particular, the guest of honour Dr Dac for accepting to host this conference in Hanoi, Vietnam. My sincere thanks should go to the representatives of the Leahy War Victim Fund of USAID for supporting this conference and other related activities associated with the work of ISPO in helping to ensure that the quality of life for people with disability is achieved. WHO has also been a major collaborator in all the Society's areas of education, training, service delivery and research and therefore we continue to register our appreciation.

As with the ISPO consensus conference on lower limb prosthetic technology in Phnom Penh, Cambodia, 1995 and the conference on orthopaedic technology in Moshi, Tanzania, 2000, we have great expectations of extending discussions on lower limb orthotics with experts from different countries and work with different organizations in developing countries. Once again, ISPO in consultation with LWVF-USAID, WHO and other organizations/ institutions has appreciated the need to gather expert views of experiences of the different technological approaches as well as the experiences and opinions of the users.

The continuing growth of the understanding for both appropriate technology and education in this field of rehabilitation medicine has, to a certain extent, resulted in raising consumer awareness in terms of their role in determining their treatment course. There have been a number of WHO conferences of different groups of people with disabilities in Helsinki, Finland, 2003; Johannesburg, South Africa, 2003 and Geneva, Switzerland, 2005 amongst others, addressing the equalisation of opportunities and their role in determining what is best for their own quality of life. This is a vivid challenge on the need to revisit the approach of our entire practice in the field of rehabilitation medicine and thereby open ourselves to an inclusion principle in order to optimize the services rendered to people with physical disabilities.

It is therefore my sincere hope that, we will reach to a consensus in most of the controversial issues in orthotics technology but if not then an understanding of these issues will stimulate and provoke positive challenges.

I look forward for a successful conference

Thank you very much.

## **Dr Dam Huu Dac, Vice Minister of Ministry of Labor, Invalids and Social Affairs (MOLISA), Vietnam**

His Excellency ISPO President, His Excellency United State Ambassador, Ladies and Gentlemen

First of all, I would like to thank the President and the Organizing Committee for inviting me and giving me the honour to address at the Opening Ceremony of this important conference. On behalf of the Ministry of Labor, Invalids and Social Affairs (MOLISA), I would like to warmly welcome all participants to the consensus conference on appropriate lower limb orthotics for developing countries held in Hanoi, the capital of our country.

Along with human history, disability have appeared and existed due to different reasons. Thanks to the rapid development of modern technology, the number of disabled persons may be reduced gradually but can not disappear totally and no one can say for sure that they will never get disabled for their whole life. This is due to on-going consequences of epidemics, diseases, contaminated environment, war, traffic accidents, and work-related accidents. In this regards, developing countries are facing great challenges and difficulties. Disability often comes along with poverty. Therefore, to help disabled people and their families get out of poverty and integrate into the society; in addition to economic assistance policies, it is necessary to provide them health support, orthopaedics and rehabilitation, particularly early detection and timely surgery. Together with the support of Government, communities and families, disabled people can feel themselves no different to other citizens and despite their disability, they are as valuable as other people and must be respected the same as other citizens.

Participants, in Vietnam, a war-torn country suffering from consequences of frequent natural disasters, the number of disabled people is 5.3 million people, covering 6.63% of the total population. Among which, the mobility disabled persons occupy the largest percentage (29.41%). For the past many years, in addition to its economic development policies, the Government has given guidelines and completed the legal system to ensure social welfare policies for everyone and particularly the social protection policies for disadvantaged group, including disabled people. With great efforts by the Government, community and support from the international organizations, hundreds of thousands of Vietnamese disabled people are rehabilitated and provided with orthopaedic devices to integrate into the society. With 20 orthopaedic and rehabilitation centres nationwide, the need for prostheses and orthoses for disabled people has been gradually matched. Remarkably, since the establishment of VIETCOT, international technology and expertise have contributed to train our rehabilitation and orthotic technologists, provide better quality rehabilitation services and orthopedic devices for disabled people. We recognize all the active and valuable support from international organizations, NGOs whose many representatives are present here today.

On behalf of MOLISA, I would like to express our sincere thanks for the kind support of international organizations and participants for Vietnamese disabled people. At the same time, I do believe that on the basis of the fine existing cooperation and for the common goal to facilitate the equal social inclusion of disabled people into the society, disabled people in Vietnam in particular and in the world in general will continue to get efficient assistance from the international prosthetics and orthotics organizations that you participants represent here. We are now advising the Government for the National Action programme on early detection, early surgery and timely rehabilitation as well as provision of good quality orthopaedic devices for disabled people to help them integrate fully and equally into the socio-economic activities of the country. We expect to share experience, expertise with all participants here and hope to get your support.

On the occasion that ISPO, in collaboration with sponsoring agencies organize this important conference, once again, I take this opportunity to wish you all good health, happiness and success.

Thank you!

## **Mr Michael Marine, US Ambassador to Vietnam**

Vice Minister Dr Dam Huu Dac, members of the International Society of Prosthetics and Orthotics, Distinguished Guests, Ladies and Gentlemen.

Good morning and thank you for inviting me to speak at the opening of the International Society of Prosthetics and Orthotics Conference. This conference brings together a diverse group of delegates from around the world. Over the next few days you will have a unique opportunity to share best practices with Vietnamese experts, to discuss quality assurance in orthotic development and delivery and most importantly, to develop a concrete set of guidelines for good orthotic treatment in the developing world.

Looking around the room, I see a tremendous amount of skill and dedication and I would like to commend the people here in this room; the Vietnamese participants who have worked tirelessly for years to improve the lives of those with disabilities and the extensive network of practitioners throughout the world who dedicate their time and energy to improving prosthetic and orthotic supply and delivery to the disabled.

This is an issue which is of great importance to the United States. My government recently announced a new contribution of \$3.1 million to assist Vietnamese living with disabilities, bringing the total United States assistance to Vietnam's disabled to over \$32 million. It is also an important issue to me personally, as my father was disabled at age 20 after losing an arm in a car accident.

I would like to use this opportunity to call on the Government of Vietnam to continue to work on and accelerate its provision of quality care to the disabled, particularly in the production and delivery of prosthetics and orthotic devices. I realize this is a costly intervention, but one which is absolutely essential for the well being of many of Vietnam's disabled. In the future, I hope Vietnam can become a model of regional excellence with a rehabilitation system its neighbors admire and copy. Now, while donor support is still strong, is the time for the Government of Vietnam to build this system and I urge Ministry of Health to dedicate appropriate resources and personnel to this very important cause.

I realize you have a very full five days ahead of you, so in conclusion, I would like to wish you all a successful and productive conference and good luck in all of your future work.

## **Mr Rob Horvath, LWVF-USAID**

Vice Minister Dac, Ambassador Marine, conference organizers, and participants

Thank you for this opportunity to speak briefly.

Let me begin by sharing Lloyd Feinberg's regrets that he was not able to make this important meeting. As most of you know, Lloyd is the manager of the War Victims Fund at USAID and his responsibilities necessitated him remaining in Washington this week. He sends his regards to the organizers and participants of this consensus conference as well as his full support for this meeting and his hopes that this conference will help to strengthen the delivery of orthotic services throughout the world.

It was in 1995, 11 years ago, that USAID, ISPO, and WHO partnered to support and sponsor the first consensus conference on prosthetic and orthotic technology in the developing world. I see many faces in the audience today that were at that consensus meeting. This is a testament both to your and our commitment to the field and, more depressingly, to our age. Probably most striking to me, however, is the fact that in 1995, the audience consisted almost entirely of expatriates. Look around you today. This is one important reason why we are here. Yes, ultimately our objectives are to provide the best services that we can to our clients, but our objectives must also include ensuring that those services are delivered by qualified and confident local staff.

Since 1998, USAID's War Victims Fund has invested over \$120 million US dollars in orthopaedic services in the developing world. We can count many successes from that investment. The United States investment has provided for the production and delivery of over a hundred thousand mobility devices and aids, the development and strengthening of over a hundred rehabilitation facilities, and the training and capacity building of hundreds of staff. In addition to this direct service support, USAID, primarily through its partnership with ISPO, has led the charge to ensure that people have access to technically appropriate, well fitting, and useful devices. However, our ultimate success does not lie in the raw number of people served.

Over the last ten years we have seen significant changes in the quality, quantity, and methods in which rehabilitation services are delivered. We are here this week to ostensibly discuss the technical aspects of orthotics services. I have no doubt that the outcomes of the week here in Vietnam will do much to move the field of orthotics in a very positive direction. Previous consensus conferences have shown this to be true.

However, I would like to remind you of our ultimate charge. That is to ensure that all people, including those with disabilities can participate as fully as possible in their families, communities, and societies. This is their inherent right and USAID is committed to this objective both in policy and in practice. Former US President Franklin Delano Roosevelt once said, "*We know that equality of individual ability has never existed and never will, but we do insist that equality of opportunity must still be sought.*" I would like to take this opportunity to applaud the level of commitment and the tremendous work that the Vietnamese government has done to help people with disabilities overcome the physical, social, and economic barriers that exist in their society.

I wish you all a productive and successful week and, on behalf of USAID, thank you all for your commitment to ensuring that people with disabilities obtain, and maintain, equitable participation in the world.

## **Mr Chapal Khasnabis, WHO**

Your Excellency, Honorable Minister of MOLISA, US Ambassador to Vietnam, Harold, Rob, my colleagues and friends, Ladies and Gentleman

Greetings from our Director and coordinator.

It is a great honour for WHO to be associated with ISPO and USAID to organize this important event. Though WHO works for the whole world, priority is always given to the people of developing countries, especially those who are poor.

Studies have shown strong links between poverty, illiteracy, poor health care, with disability and exclusion. As a group, persons with disabilities are among the most marginalized. Poverty increases disability, at the same time, disability enhances poverty. People living in poverty are more likely to acquire disability.

People with disabilities and their family members usually have less opportunity and are deprived of basic human rights - rights to access food, education, shelter, healthcare and rehabilitation services etc. In any community, often the poorest of the poor are people with disabilities and their family members. Among all, orthotics users are usually the poorest. Many causes which create the demand for orthoses are due to poverty such as polio, leprosy etc. Fortunately, those numbers are going down drastically but the people who are already affected especially children need orthotics and rehabilitation services for long time.

The number of disabled persons is growing also, as a result of factors such as poverty, population growth, ageing and medical advances that preserve and prolong life. Obviously, need of orthotics services are also growing.

With appropriate orthotics and rehabilitation services, one can more successfully come out of poverty, access equal rights and opportunities, and meet their basic needs. Lower limb orthotics is often the first step for a child to go to school, play or adults to make an income. Orthotics is an important tool for many users to be included in the society and overcome poverty.

Considering the need and importance, WHO requests for partnership to invest in orthotics sector to develop appropriate orthotics technology, manpower and service delivery system with good follow up in developing countries.

WHO counts on your knowledge, expertise and goodwill to make millions of children and adults to have a better quality of life with equal rights and dignity. It is we who can convert these millions of people from passive receivers to active contributors, from isolation to inclusion - a world for all. Let us join hands to achieve it.

Thank you.

## **Mr Guenter Rietmacher, GTZ Country Director**

Vietnam, a country of 80 million inhabitants, faces an enormous problem in rehabilitating its disabled population; a problem of developing countries that was exacerbated by the wars the country has endured in recent decades.

Estimates based on World Health Organization (WHO) data and calculation methods suggest that 0.5% of the population, or 400 000 Vietnamese, are in need of rehabilitative health care. Official statements of Hanoi government offices double this estimate. These offices report that 0.8%-1% of the population, about 800 000 Vietnamese, are physically handicapped.

Whatever the actual figure, it is increasing due to an alarming rise in traffic accidents in major cities that too often result in amputation or physical disability. According to official figures poliomyelitis as an infectious disease has been eradicated in Vietnam, but post polio care for thousands of patients is still a task to be tackled. Children with congenital clubfeet deformities and cerebral palsy are in need of the orthopedic services. This group of patients is the focal area in rehabilitation to avoid or reduce severe deformities.

In light of the tremendous need for qualified orthotics and prosthetics specialists in Vietnam, the Federal Republic of Germany and the Socialist Republic of Vietnam have initiated co-operation through government-sponsored programmes of "Technical Collaboration" (GTZ). A bilateral agreement between the governments has led to the establishment and management of an orthotics and prosthetics training centre in Hanoi which has started its programme in October 1997. The Vietnamese Training Centre for Orthopedic Technologists (VIETCOT) has trained up to date 120 orthopedic technologists based on standards of ISPO and WHO, who can provide service for 360,000 people with physical disabilities around the country. Germany has contributed around 10 Mio Euro since the start of the project. Thanks to the good work of the Vietnamese crew and its German advisor Mr. Wilfried Raab, VIETCOT has now an excellent international reputation with participants from other Asian and even African countries.

Focused on the increasing demand in orthotic rehabilitation services, VIETCOT is offering skills upgrading seminars for professionals in order to improve the quality of these services in the country.

The German Agency for Technical Cooperation is therefore very happy and thankful, that ISPO is organising the Consensus Conference on Appropriate Lower Limb Orthotics for Developing Countries in Vietnam, Hanoi. We hope that the outcome after six days hard work will be of great use for the rehabilitation of people with physical disability in developing countries. In case you find the time please visit the VIETCOT training centre and get inspired by the good work they are doing.

On behalf of the German Government and GTZ, I would like to wish you a pleasant stay in Hanoi, a good working atmosphere and a successful week.

## **Introduction to the conference**

### **Bakht Sarwar, Conference Chairman**

Dear colleagues and friends

Today I have the honour and the pleasure to welcome you all for a consensus conference on appropriate lower limb orthotics for developing countries. We have a very full, hard working and demanding week ahead of us.

ISPO has held six such conferences in the past sixteen years. Each has been very successful at arriving at specific suggestions for improved practices. Previously the emphasis has been placed on a diligent literature review. Best practices were determined based on the weight of that literature and discussions that ensued.

A detailed review of the literature on orthotic design and use in developing countries was done by Robert Singer spanning a time from the early 1970s to the year 2000 based on a series of 103 articles obtained from a RECAL. It was presented in International consensus conference on Appropriate Technology in developing countries held from 18-22 September 2000 in Moshi Tanzania. A copy has been distributed to you. In the preparation of this conference we have not done such a review aside from that which each of the presenters may have done in the preparation of their manuscripts. Based on the conclusions reached in the previous consensus conferences we are here to discuss the issues surrounding appropriate lower limb orthotics for the developing countries about which little literature exists. The present workshop is mainly addressing the ground realities and practices presently done in the developing countries.

Considering that most of the participants who attended the consensus conference in Moshi in 2000 have had more than 5 years further experience, and also the fact that many new experts from developing countries have now joined the group, it may in fact be correct to assume that this group has a greater collective experience in this field than any other group which has ever met.

You are not here to listen, you are here to contribute and actively participate in discussions. As is usual in ISPO consensus conferences the format will be number of sessions each with a series of papers as back ground information on topics for discussions which have been identified by the steering committee. Following each such session we will divide in to small groups for syndicate discussions. Specific questions and issues arising from the presentations will be identified. Each will be brought before at least two of the syndicate groups. Reports will be brought back to plenary sessions for further discussions hopefully arriving at consensus on the different topics. At the end of this conference the steering committee will meet again to collect these conclusions and ultimately write a report of the conference.

I would like to thank all of you for coming. I would of course also like to thank USAID and WHO for making the conference possible, ISPO for realizing it, and VIETCOT for all the practical arrangements in and around this event.

I wish you all a very interesting, fruitful and successful week.

Thank you.

## **Conclusions and recommendations**

The conference agreed upon the following conclusions and recommendations listed under their respective sub-headings.

### **Needs assessment**

1. Need of orthotics has not been met and orthotics should be given greater attention.
2. The greatest area of need is the lower limbs.
3. Epidemiological data collection related to orthotics needs is required for policy and service development.
4. Standardised tools and methodology need to be developed and implemented for data collection.

### **Outcome assessment**

1. Reliable patient record keeping is essential for all phases of orthotic management including prescription, checkout and follow-up.
2. Regular follow-up/evaluation of outcomes of orthotic management should be performed. This should include functional outcomes.
3. User involvement including satisfaction surveys must be an integral part of outcome assessment.
4. User satisfaction surveys should be performed and include measures of the impact of orthotic management to enhance the quality of life.

### **Education**

1. There remains an overwhelming unmet need for trained persons to work in the orthotics sector in developing countries.
2. The meeting endorses the ISPO standards of education and the WHO/ISPO guidelines for education and training.
3. There is a need for upgraded knowledge and understanding of medical and rehabilitation personnel in issues relevant to orthotic management.
4. Need for upgraded knowledge and understanding of relevant pathologies for orthotics personnel.
5. The conference endorses the use of quality management and outcome systems in P&O educational institutions.
6. P&O schools should promote the role of orthotics in rehabilitation, the rehabilitation team and continuing education.
7. ISPO should establish a working group to investigate issues related to the provision of orthopaedic footwear in developing countries.

### **Technology**

1. Need for research, development, production and evaluation of appropriate\* orthotic components
2. ISPO should explore and implement methods to share and transfer appropriate technology.
3. ISPO should promote and encourage the coordination of availability and accessibility to appropriate orthotic technology.

### **Rehabilitation team**

1. Establish better links between orthotic service and user groups
2. The user/family must be an equal member of the rehabilitation team
3. There is a great need for exchange of information between different rehabilitation personnel.
4. It is recognised that the full clinical team is not always available. However it is recommended that the minimal clinical team should include the user/family and the orthotist.

### **Community based rehabilitation**

1. Establish a network between the orthotic service and CBR, PHC and/or other community based programmes - an example of a positive relationship between CBR and orthotic services is the implementation of the Ponseti club foot management programme in Uganda, amongst other places.
2. A close working relationship between CBR programmes and the orthotics service providers should facilitate early detection, early intervention and follow-up to promote optimum functional capacity and prevent further impairment.

### **Quality management**

1. Schools should promote the knowledge and need of quality orthotic services as a part of their education curriculum.
2. Orthotic service providers need to develop and implement quality management procedures.
3. The conference endorses the use of quality management and outcome systems in orthotic service delivery.

### **Cost calculation**

1. The conference recommends promotion, feedback, evaluation and development of the ISPO/USAID cost calculation tool.
2. It is recommended that the individual P&O schools use the ISPO/USAID cost calculation tool in their curriculum.
3. Recommend the establishment of a forum through which users of the ISPO/USAID cost calculation tool can communicate.

### **General**

1. Orthotic management should address the most common conditions encountered in the field. These include; cerebral palsy, clubfoot, polio, stroke/traumatic brain injury and the insensate foot.
2. Orthotic treatment should be based upon individual assessment of the patients functional deficit
3. General orthotics treatment protocols may be impractical due to the variability of individual patients' presentation.

## Syndicate reports

### Syndicates A

#### Discussion questions

1. Needs assessment –
  - a. What is the current orthotic scenario in developing countries?
  - b. What data needs to be collected?
  - c. What is required to be done?  
*(Syndicates A1, A2, A3)*
  
2. Based upon the conference programme, what areas would you like to see consensus reached? Identify three areas in which you would hope consensus can be reached.  
*(Syndicates A1, A2, A3)*
  
3. What is necessary to deliver appropriate orthotic services in developing countries?  
*(Syndicates A4, A5)*
  
4. Based upon the conference programme, what areas would you like to see consensus reached? Identify three areas in which you would hope consensus can be reached.  
*(Syndicates A4, A5)*

## Syndicate A reports

### Group A1 report

Chairman: Mel Stills  
Rapporteur: Carson Harte  
Participants:

Alaa	Endley	Robijn
Bowers	Museru	Steenbeek
Ghosh	Nguyen Hong Ha	Tran Van Chuong
Hascinovic	Penny	Urseau
Khasnabis	Pierron	Zelaya
Krishnan		

#### 1. Needs assessment

##### a. What is the current scenario in developing countries?

Based on the presentations made in the sessions prior to the syndicate, the impression given is that there are not enough trained personnel in developing countries. The energy required to train more people is restricted because there is not enough awareness and appreciation of the impact LLO can make. This applies to both resource holders and to potential clients. This factor is limiting the uptake of orthotics services

The quality of available devices, whether the quality is low because of material, components or technique, helps reinforce the undervaluing of LLO services. Clients are not valuing low quality services. Resource holders may be witnessing services that are of suspect quality and negatively judging the efficacy of orthotics services based on misinformation.

There are three main components of a good orthotics service: service delivery infrastructure, technology/materials and trained manpower.

To understand the orthotics needs in a country, we need to understand the profile of disabling diseases. These patterns are changing as polio declines and changes its demography (the majority of patients are now middle aged or older) CP is on the increase as better health care means more borderline children survive birth trauma.

Demand for orthotics treatment does not come easily from the clients since the output is not easily understood by them. Prosthetics is much more explainable and simpler to implement. This applies to the public and more importantly to doctors, therapist and health care workers.

It is important when planning to be aware of the state of general health and medical care in the country. It is not sensible to develop a high level service when the rest of the services are at a low level.

It is important that salary structure and schemes of service are clearly understood and negotiated before training people otherwise valuable people can be lost. The attitude of policy makers must be understood or perhaps influenced and changed. Government leaders are not likely to understand the effectiveness (in both cost and social terms) of the implementation of good services.

Some members called for the publication of more guidelines, research papers and public relations literature that could be used to educate officials. This should include some evidence based practice research. However, the caveat was issued that research should be of good quality and should only be applied to orthotics practice of sound quality. It is unconscionable that good research should be used to make decisions based on the impact of poor practice.

Post-conflict intervention tends to concentrate on prosthetics services. Orthotics tends to be an afterthought. The actual situation is that orthotics services demand a higher degree of training and engagement.

The question was raised, should we lower orthotics quality so we can fit more patients. The group concluded that we should not compromise on good sound technique but should be able to apply it to all levels of technology and material according to the country and individuals capacity to pay.

Example: one may drive an old cheap car, but one should not be a bad driver.

The key to good quality is well trained staff who can adapt to materials and conditions. We should apply best practice. Get basic principles right and apply them to different materials and technologies. Lowering training standards is a very dangerous route. If devices are not well fitted it will undermine the value of the service in the eyes of stake holders. The panel thought well of the work of Huckstep in Africa. He used low technology materials and achieved good results.

It was agreed that training is not to be compromised. The level of technology and material to be used will be decided by the stakeholders.

It is important that the other members of the clinical team understand the advantages of a good Orthotic service. If the surgeons and PTs see the value, they will be good allies. We should strategise with them.

It was felt that training schools should be careful how they are set up. High tech, expensive workshops can discourage graduates from entering private practice, because the cost appears prohibitive. It is important we teach with local machines etc where possible.

#### **b. What data needs to be collected?**

Collect data on the political willingness to have an orthotics service. Estimate the support of the rehabilitation professionals.

Situation analysis: What is going on already in the country?

Who collects disability data? Seek epidemiology department help. Develop outcome data. Follow-up study.

Data on its own is wasted. Collected data should be used to influence and engage the other rehab professions. Alliances should be fostered.

Data is seldom collected within a national framework. We should encourage this sort of behaviour. The data should be used to develop a national strategy. NB: Data should be well presented and in the right format. Disease data is very well understood, the rehabilitation data is often fragmented, poorly thought through and poorly presented.

#### **c. What needs to be done?**

##### *General comments*

We need to better understand the status of orthotics training. Despite the fact that orthotics practice is often more demanding than prosthetics, we often find that training material is not that well developed. Donors have focused too much on prosthetics as the glamorous subject we need to reset the bias. Best students need to be engaged in orthotics by challenging their intellect.

We need to understand the numbers of orthotists needed in the country/region and plan accordingly.

Bear in mind and encourage students on graduation to embrace the private sector as well. Donors and institutions should be encouraged to support or subsidise the private sector. Clients are the poorest of the poor and hence financial sustainability is hard to achieve without help. This help should not just be towards the major centres.

We should figure out the main causes of disability in the country and plan to reduce that.

#### *Clinic team*

Work closely with orthopaedic surgeons and other rehab people in data collection, needs assessment and planning. Some delegates feel the clinic team aspiration is lost as orthopaedic surgeons move away from their traditional role and exclusively towards surgery. Most practitioners do not see the model of the cosy clinic team working, rather the reality is that the Orthotist, therapist, surgeon work separately, but in a trusting relationship with one another, knowing intuitively when to seek each others help.

### **2. Based upon the conference programme what areas would you like to see consensus reached? Identify three areas where you would like to see consensus achieved at this conference.**

#### i. Data.

A simple definition of “disability” relating to mobility impairment that could be applied in data collection exercises.

#### ii. Technology.

Simple definition of appropriate LLO technology that defines design, material, technique, accessibility and affordability of devices

#### iii. Outcomes.

Identify a series of outcome measures that embrace clinical treatment outcomes, mobility outcomes, social inclusion outcomes and impact on quality of life. That can be used as a basis for evidence based practice.

## Group 2A report

Chairman:	John Fisk		
Rapporteur:	Heinz Trebbin		
Participants:			
	Andrew	Kim Bo Song	Nguyen Lan Anh
	Camacho	Kumar	Poetsma
	Dunleavy	Link	Rodriguez
	Folcalvez	Mey	Schlierf
	Gillani	Nagels	Zhao Huisan
	Horvarth		

### 1. Needs assessment

#### a. What is the current orthotic scenario in developing countries?

Each participant represented a location so unique and different that a consensus was impossible to arrive at. The following list of items is to be considered:

- Distribution of services, city vs. rural
- Available facilities in a given region
- Available practitioners + rehabilitation team
- Education of teams members
- Recognition of orthotist/prosthetist profession
- Regulation of services
- Referral system, case identification
- Quality of prescription by medical doctors
- Follow-up of services:
  - Practice effectiveness
  - Patient care
  - Best practice

Observation: Orthotics is more difficult to deal with than prosthetics

#### b. What data needs to be collected?

- Causes of disability
- Type of disability including severity
- Needed and available services

#### c. What is required to be done?

A simplified system for functional evaluation of disability:

- Outcome studies based on functional evaluation and social inclusion
- Create more evidence on clinical outcomes as a measure of service effectiveness

### 2. Based upon the conference programme, what areas would you like to see consensus reached?

- Consensus statements based on realistic and practical recommendations
- Educational recommendations:
  - Orthotics prescription who and what
  - Members of the team starting with the patient and family
  - Mentoring
  - Continuing education
  - Multidisciplinary educational experience
  - Exchange of experiences between countries and schools
- The orthotics management of:
  - The insensate foot (diabetes and leprosy)

- Clubfoot and other congenital deformities
  - Post-trauma (fracture bracing)
  - Realistic expectations of orthotics management
- What should be the minimum conditions and resources available before starting an orthotic program?
- Mechanisms for case identification, CBR is not working

## Group 3A report

Chairman: J Steen Jensen  
Rapporteur: Gordon Ruder  
Participants:

Bhanti	Kim San	Schiappacasse
Canicave	Lastring	Shangali
Do Trong Anh	Long Hua	Tardif
Eberle	Möller	Thomas
Gul	Naik	Verhoeff
Jones	Pokora	Visser

### 1. Needs assessment

#### a. What is the current orthotic scenario in developing countries?

- Regardless of the materials/components used, the function and the fit are paramount.
- Not so much “high-tech” or “low-tech”, but *right-tech*
- Metal (steel, aluminium), and leather, is often the most appropriate.
- Plastic is often not resilient enough to withstand climate and/or work conditions. Locally available plastics can be used, if appropriate and experienced in working with the material.
- ICRC based component where available.

#### b. What data needs to be collected?

- Disability information, using a standardised, sensitive, and globally accepted “tool”
- Assess the region: availability of materials, resources, care givers, rural/urban
- Before surveys are sent out, retrospective studies from existing hospital data bases should be completed.

#### c. What is required to be done?

- Disability information needs to be collected from the urban and rural sources and then centralised within a country.
- Each disabled person has a “handicap card” where their information is stored. (as in India)
- Surveys should be run through existing infra structures CBR, health care systems
- Governments need to be made to hear our concerns. User groups may be able to help.
- Minimum educational requirement is a formal orthotics technologist education of 1year (schooling) and 6 months (clinical placement). Must involve clinical team work is also.

### 2. Based upon the conference programme, what areas would you like to see consensus reached? Identify three areas in which you would hope consensus can be reached.

- i. Standardization and control of treatment guidelines. Recognising the patient as a part of the team. Pool resources from various global regions, and make available through the ISPO web page. Follow-up and outcomes is mandatory.
- ii. Standardization and qualification of training. Consistent terminology.
- iii. Encourage clinicians to be able to design the best device for the individual patient. Not to “over brace”, or only repeat designs that you are comfortable with.

## Group A4 report

Chairman: Sepp Heim  
Rapporteur: Dan Blocka  
Participants:

Dang Xuan Khang	Kelly	Raab
Eboh	Koll	Sarwar
Francis	Le Ha Van	Sibila
Haq	Mtalo	Tazawa
Heagarty	Nepali	Watts
Henlein	Pham Thi Hoa	

### 3. What is necessary to deliver appropriate orthotic services in developing countries?

a. A functional rehabilitation team:

- The ideal situation is the full rehabilitation team.
- Realistically this could encompass a less comprehensive group, but they would then have to encompass a wider scope of competencies across the professions.
- The minimum team would be an orthotist with medical backing and the ability to seek out other health professionals if necessary.
- The implementation of a complete patient assessment, orthotic prescription and the development of a treatment plan must be assured.

b. "Follow-up" procedures must be implemented in the treatment plan of an individual receiving orthotic services.

c. The capacity for early detection and intervention should be an element incorporated in a service involved in the provision of orthoses.

### 4. Based upon the conference programme, what areas would you like to see consensus reached? Identify three areas in which you would hope consensus can be reached

i. To find realistic solutions to orthotic services in developing countries:

- a. Consensus on the required level of training for these services.
- b. Consensus on the appropriate materials and components required.
- c. Consensus on a method that would facilitate a practical way to share and transfer technology.
- d. Consensus on the appropriate treatment plan for various clinical issues confronted in the field.

ii. What is the prevalence of disability as it relates to the provision of orthoses?

- a. Consensus on the definition of what disability is.
- b. Develop a cooperation and standardized method for determining what the prevalence of disability is.

iii. Consensus on a strategy to facilitate the process of measuring outcomes to affect the quality and effectiveness of the provision of orthoses. This would be in terms of proper data collection, the development of measurement tools and the analysis of data.

- a. Consensus about finding a standardized template to collect the necessary statistics.
- b. Consensus on how to evaluate the outcome of a treatment.

iv. Others

- a. Consensus on a how to prioritize orthotic treatment for various scenarios where there are limited resources.
- b. Consensus on developing a cooperative strategy for the NGO involvement when orthotic services are required.

## Group A5 report

Chairman: Nerrolyn Ramstrand  
Rapporteur: Aaron Leung  
Participants:

Borgne	Le Hai Ahn	Pham Thuy
DeMuth	Mannion	Rechsteiner
Fang Xin	McMonagle	Savino
Frank	Muller	Sovann
Hjelmström	Nguyen Hai Thanh	Williams
Kouma		

### 3. What is necessary to deliver appropriate orthotic services in developing countries?

#### a. Education:

- systematic training & education of the profession
- continuing education of the profession
- collaboration among schools to have instructors exchange programme
- simple means of sharing of information

#### b. Recognition of the profession:

- incentive and social status
- to attract people with good quality to work in the field

#### c. Manpower

- the qualified persons to provide the service

#### d. Patient education

- for patient compliance & proper use of the orthosis

#### e. Appropriate service;

- to fulfill patients' needs

#### f. Cost effectiveness:

- for effective service delivery

#### g. Appropriate materials:

- to fulfil local needs
- with support from local industry

#### h. Environment:

- understanding of the existing system or service provision

#### i. Outcome evaluation:

- to ensure the need and quality of the service

#### j. Multi-disciplinary approach:

- patient centered
- availability of relevant service, e.g. surgery, therapeutics

#### k. Follow-up of patients:

- accessibility (e.g. location of service centre)

#### l. Epidemiological data:

- needs assessment

#### m. Governmental support:

- how to convince the government

- health and social policy
- n. An active advocacy group
- collaboration among organisations including NGOs and government

**4. Based upon the conference programme, what areas would you like to see consensus reached? Identify three areas in which you would hope consensus can be reached**

- i. Data collection for needs and outcomes
- ii. Practice guidelines. Prioritize the types of orthotic service provision
- iii. Appropriateness - custom made vs prefabricated
- iv. Cost recovery - means of addressing this issue

## Plenary discussion – Syndicates A

### Discussion

Following presentation by groups who were assigned the task of discussion Questions 1 and 2, the following discussion points were made:

Initial discussion focused upon the perception of prosthetics and orthotics services by governmental authorities and by members of society. It was recognised that orthotics is often an undervalued service in developing countries and delegates were interested in discussing means by which this situation could be rectified. It was recognised that the services provided must be appropriate for the patient and the region and that anything less than this would result in government authorities and members of society not valuing the service. In addition, it was stated that consensus papers must make a strong impact.

There was much discussion about the usefulness of Community Based Rehabilitation (CBR) as a referral source for patients requiring orthoses and as a means of following up patients. Some delegates expressed the opinion that CBR is not beneficial to potential and existing patients with orthoses. This opinion was opposed by other delegates who believed that some beneficial programmes do exist in developing countries. Much of the success of these programmes was attributed to motivated and highly active individuals. It was also stated that the beneficial effects of CBR are not immediate and that it may take a generation before any obvious benefit is observed.

The issue of education of physicians and allied health professionals on the availability and benefits of orthotics services was raised. In recognising the need for improving education of medical and other health professions, delegates identified the schools for prosthetics and orthotics as having a key responsibility in providing this information.

In discussing the needs and necessary requirements for orthotics services in developing countries, it was noted that focus on the patient was an area that received little attention in syndicate groups. This was recognised as an element of orthotic management that requires attention. The group was reminded that the patients should be included as a member of the clinical team. Qualitative research with orthoses users was encouraged.

While patient advocacy groups were noted as important and as having the potential to influence policy makers, the group was cautious about placing too much emphasis on these groups to steer policy makers as often such groups promote their own issues without consideration of the limited funding available.

The issue of patient follow-up was raised. Delegates were interested in discussing the most appropriate means of following-up of patients who live in remote communities. This was recognised as a major problem and concern. It was believed that improved communication between clinics would facilitate this problem along with good quality outreach and CBR programmes.

## Syndicates B

### Discussion questions

1. What are the elements associated with providing appropriate orthotic technology/service?  
*(Syndicates B1, B3)*
2. What are the barriers to offering good practice in developing countries?  
*(Syndicates B1, B2)*
3. How do we ensure that the scope of pathologies is covered and the associated orthotic services are available and provided?  
*(Syndicates B2, B3)*
4. Is the current education of members of the clinical team sufficient? What steps should be taken to facilitate a team approach?  
*(Syndicates B4, B5)*
5. What are the elements of a treatment plan that are necessary for good practice strategies for orthotics services? How does the team share responsibility for these elements?  
*(Syndicates B4, B5)*

## Group B1 report

Chairman: Dan Blocka  
Rapporteur: Longini Mtalo  
Participants:

Khasnabis	Möller	Frank
Pierron	Do Trong Anh	Muller
Camacho	Jones	Sovann
Kumar	Francis	Fisk
Poetsma	Sibila	Thomas
Eberle		

### 1. What are the elements associated with providing appropriate orthotic technology/service?

Elements involved in the provision of orthotic technology:

- ISPO appropriate technology definition was used as a framework for the discussion.
- From a technology point of view – it should be affordable and available and adhere to the principles of proper fit and alignment.
- The materials and components implemented should be optimal for what is available and of high quality. They should also take into account the climatic conditions that exist in the region.
- There must be proper education and training in the implementation of orthotic technology.
- There must be a way to provide resources needed to improve the availability of other ranges of orthotic technology.
- The orthotic technology should meet the objectives of the treatment plan developed.
- Research related activities should be initiated to investigate how the technology performs.

Elements involved in the provision of orthotic service:

- The service provision must have equal access, be within a reasonable reach and be sustainable in the country.
- Those involved in providing the service must be properly educated.
- Physical facilities must be appropriate in terms of accessibility, appearance, cleanliness, and have the appropriate patient areas for assessment and treatment. This also includes a safe working environment for the professional staff.
- The service should provide a caring and respectful attitude.
- The service should have outreach capabilities to provide service in the regions where it is absent.
- Elements of quality management should be implemented:
  - proper job descriptions
  - to deal with gender equality issues
  - to ensure proper procedures are performed
- Research related activities should be initiated to investigate how the service performs.

### 2. What are the barriers to offering good practice in developing countries?

- Geographical barriers - both distance and geographical
- The volumes of patients and demands on the service exceed capacity.
- A lack of qualified professionals to provide a proper service.
- Poor coordination among the orthotic service providers and at times a rivalry exists between these groups.
- The involved government does not recognize the need for such services and therefore does not provide the support the service in terms of a proper payment scheme (for salaries and/or the payment of orthoses), implementing proper regulations and recognizing competent professionals.
- NGOs involved do not implement a sustainable plan for the service.

- There is a lack of data for individuals requiring orthoses.
- There is a lack of proper statistics with regard to the service.
- Taboos/traditional beliefs create barriers to one receiving proper orthotic services.
- Corruption in the system!

## Group B2 – report

Chairman: Bakht Sarwar  
Rapporteur: Olle Hjelmström  
Participants:

Nepali	Rodriguez	Tazawa
Krishnan	Gul	Ruder
Robijn	Naik	Nguyen Hai Thanh
Penny	Visser	Trinh Quang Dung
Dunleavy	Haq	Savino
Link		

### 2. What are the barriers to offering good practice in developing countries?

- a. Manpower:
  - Lack or non-existence of qualified orthotist (Cat-I and Cat-II) and technicians (Cat-III)
  - Interdisciplinary services/upgrading education
  - Awareness among the stakeholders(both public and professionals)
- b. Infrastructure:
  - No service structure
  - Lack or non-existence of orthotic centres both in public and private sector
  - Treatment protocol, no standard way of how to do/solve problem
  - Interaction of knowledge
  - No referral system
  - Follow-up
- c. Materials and components:
  - Non-availability of materials and components
  - Lack of information and know-how
  - Finances
- d. General:
  - Low priority
  - Evidence of effectiveness
  - Communications
  - Untrained workers
  - No quality control
  - Expectations of from user/other treatment consultant
  - Prioritize cases/selection of case
  - Lack of incentives, demand is higher then the capability
  - Commitment
  - Geographic distribution
  - Lack of education materials especially in local languages
  - Corruption

### 3. How do we ensure that the scope of pathologies is covered and the associated orthotic services are available and provided?

- Availability of appropriate orthotic services
- Awareness/knowledge about the existence of orthotic services amongst all the stakeholders
- Scope of pathologies can only be covered with the involvement of the full rehabilitation team
- Involvement of ordinary schools and community to give information on problem that can exist in the area
- Information in the clinics that treat the area of problem
- Continuing education for the professions working with cases

- Short workshops
- Client involvement
- Workshop to educate caregivers
- Acknowledge of the services
- Data collection of the pathologies in the area
- Protocols how treatment can solve specific problems

## Group B3 report

Chairman: Sharon DeMuth  
Rapporteur: Christine McMonagle  
Participants:

Tran Van Chuong	Schlierf	Borgne
Mendley	Kim San	Kouma
Steenbeek	Pokora	Pham Thuy
Harte	Henlein	Williams
Folcalvez	Pham Thi Hoa	Heagarty
Mey		

### 1. What are the elements associated with providing appropriate orthotic technology/ service?

Appropriate technology definition:

- *“A system providing proper fit and alignment based on sound biomechanical principles which suits the needs of the individual and can be sustained by the country at the most economical and affordable price.”*
- We discussed if definition only considers the device rather than process
- machinery, skills, materials
- depends on context

The 3 As

- Affordability
- Availability
- Accessibility

Training

- Appropriate training for all rehabilitation staff
- Personnel
- ISPO Category-II accreditation - is this necessary?
- Academic training
- Practical training
- More schools offering training in single discipline would be useful - need for more orthotists , however, 3 years training has greater recognition
- Need for regulation of training in-country, recognized by country
- Need for supervision by Category-I orthotists

Clinic team

- Clear definition of roles and expectations
- Patient and family, orthotist, physiotherapist - minimum
- When is doctor involved? -surgical, complex cases, specific pathologies
- Important that more clinic team members do not increase cost
- Referral systems and follow-up
- Effective systems of communication

Additional elements

- Infrastructure
- Finance
- Quality
- System for patient advocacy
- Patient motivation
- Standards of time/cost/personnel calculation to make an orthosis - need to be placed in local context
- Specialized footwear

#### Scope of pathologies

- Need to ask what pathologies can system deal with effectively
  - Record keeping / data collection - share among service providers
  - Training
  - Personnel - skills
  - Prioritization based on intervention effectiveness
- Definition of point at which orthotist becomes involved

#### Orthotic services

- Focus on functional deficit rather than pathology
- Treatment protocols
- Early identification and referral
- Proper referral system that involves all levels of health system
- Role of CBR
- Understand limits of professional role
- Outreach with appropriate personnel (different functions, discussion on appropriateness)

#### Role of government

- Numbers of personnel – trained and skilled
- Government involvement
- Finance
- Facilities
- Infrastructure
- Trained staff
- Other providers

## Group B4 report

Chairman: Theo Verhoeff  
Rapporteur: Robert Bowers  
Participants:

Museru	Lastring	Kelly
Raab	Shangali	Le Hai Ahn
Gillani	Schiappacasse	Rechsteiner
Nagels	Dang Xuan Khang	Mannion
Bhanti	Koll	Zelaya

### 4. Is the current education of members of the clinical team sufficient? What steps should be taken to facilitate a team approach?

Sufficiency of training:

Orthopaedic Surgeon	no
Rehabilitation Doctor	no
Orthotist/prosthetist (if role is to be expanded)	no
Physiotherapist	no

Steps to be taken to facilitate a team approach:

- Training
  - ISPO and WHO recommendations to include prosthetics and orthotics in respective curricula (medicine, PT etc.)
  - Rotate rehabilitation medicine /orthopaedic staff in training through orthotics
  - Make this a condition of new orthotic services
  - Emphasise team approach in (distance) learning material?
- Communication
  - Regular meeting - discuss cases
  - Organise workshops on issues of concern
  - Address weaknesses
- Co-location of participating services
  - Orthotics located beside surgery, PT etc.

### 5. What are the elements of a treatment plan that are necessary for good practice for orthotics services? How does the team share responsibility for these elements?

- Respect patients desires/aspirations
- Consider availability, accessibility, affordability
- Increase awareness of availability of services
- Set treatment protocol:
  - Referral, assessment, individual functional goals, prescription, measurement/casting, manufacture, fitting, training, delivery/check-out, assessment of outcome, follow-up
  - Use appropriate tools to measure outcomes at beginning, middle and end

Motivate staff to work towards shared goals

Share of responsibility by the team:

- Referral Doctor? PT?
- Assessment Doctor, orthotist, PT?
- Goal-setting Team
- Prescription Cat-I P/O or Doctor
- Measurement/casting Orthotist

- Manufacture Technician
- Fitting Orthotist
- Training PT/Orthotist
- Delivery/checkout Orthotist? Doctor? Team?
- Assessment of outcome Orthotist? Doctor? Team?
- Follow-up Orthotist? Doctor? Team?

## Group B5 report

Chairman: Heinz Trebbin  
Rapporteur: Ritu Ghosh  
Participants:

Hascinovic	Zhao Huisan	Le Ha Van
Nguyen Hong Ha	Canicave	Fang Xin
Urseau	Long Hua	Alaa
Andrew	Tardif	Leung
Kim Bo Song	Eboh	Watts
Nguyen Lan Anh		

### 4. Is the current education of members of the clinical team sufficient?

- Composition of clinical team is not clear. In reality, rehabilitation team does not exist in most part of the world. Many clinical/rehabilitation professionals even do not exist in developing countries. There are only few branches of rehabilitation professionals are available in developing countries and that too only in capital or major cities.
- Members of the group had vast experience of working in different situations and context. They had to take different approaches considering the ground reality for example, in some instances orthotist only had to make prescription, assessment, measurement, casting, assembling and fitting whereas, in some countries orthotist and therapist worked together. Group agreed that suggestions need to be practical and simple, considering the absence of ideal situation.
- Minimum clinical team could be combination of therapist and orthotist and if there is possibility, then it is always better to involve medical doctors for prescription and intervention plan.
- It was also mentioned that present education system and service delivery system also does not encourage the team approach. Rehabilitation professionals are not trained to exchange professional discussion and to participate in clinical team. The reality is that there is lack of knowledge among the orthotist about medical aspect and proper evaluation system and prescription criteria. On the other hand, the medical and other paramedical professionals also have very little knowledge about orthotics and its allied issues.

### What steps should be taken to facilitate a team approach?

The following points were discussed:

- ISPO should facilitate to conduct orientation programme for medical and paramedical professional regarding orthotics.
- Prosthetics and orthotics schools could promote and involve in training/orientation of medical personnel, physiotherapist/occupational therapist and other health personnel in orthotics management.
- Medical doctors, therapist and orthotist need to have broader knowledge of each others areas of work and strengthen functional referral system within.
- Publish books, scientific articles, evidenced based practices, produce promotional videos on different aspects of orthotics technology and service delivery system. It was also suggested that more documents and literatures need to be available on internet.
- Add a chapter or two about orthotics management in the course curriculum of medical and paramedical personnel and add some therapeutic and medical conditions including management in orthotics course curriculum.
- Joint seminar/workshops involving medical doctors, orthotist, therapist and other health personnel

- Team members need to be treated equally - respect for each other
- ISPO could consider influencing world bodies of PT/OT to develop different levels of manpower as in prosthetics and orthotics

**5. What are the elements of a treatment plan that are necessary for good practice strategies for orthotics services?**

- Good diagnosis, prescription, good checkout and define functional outcome, linkage with health and CBR personnel

**How does the team share the responsibility for these elements?**

- It has been mostly covered in discussion on question 4

## **Plenary discussion – Syndicate B**

***Editors note: No reporting of the discussion is available for this session***

## Syndicates C

### Discussion questions

1. How do you measure user satisfaction after delivering a new orthosis?  
*(Syndicates C1, C3)*
2. What information should be collected to determine the effectiveness of a lower limb orthosis?  
*(Syndicates C2, C4)*
3. Is there a difference in quality management protocols between the industrial world and the developing world and if so what are they?  
*(Syndicates C1, C5)*
4. Do orthotic services for the care of children with cerebral palsy in the developing world need to be improved. How?  
*(Syndicates C2, C4)*
5. Do orthotic services for the care of patients with post-polio paralysis in the developing world need to be improved. How?  
*(Syndicates C3, C5)*

## Group C1 report

Chairman: Longini Mtalo  
Rapporteur: Anthony Francis  
Participants:

Fisk	Long Hua	Pierron
Frank	McMonagle	Tardif
Harte	Nguyen Lan Anh	Tazawa
Henlein	Pham Thi Hoa	Tran Van Chuong
Leung	Pham Thuy	Urseau

### 1. How do you measure user satisfaction after delivering a new orthosis?

- Fit, function, comfort, acceptability, durability, pain, cosmesis, alignment
- Identification of client expectations:
  - Do they coincide with clinician expectations?
  - Are expectations realistic?
  - Do we need to raise our clients' expectations?
  - Have expectations been met?
- Focus on 'User' satisfaction v technical/clinical satisfaction
- Outcome measures - subjective or objective?
  - Functional assessment useful tool but it may not equate to user satisfaction
  - Patient satisfaction survey:
    - o Does user know what a 'good' orthosis is? What are they comparing to?
    - o Are they trying to impress surveyor?
    - o 3rd party/independent assessor required
    - o Does the user feel free to be critical and to really express opinion?
    - o Satisfaction measure should include the 'whole service' not just the orthosis
  - Questionnaire designed to identify areas of concern and improvement
  - Follow up / review process: is the client using the orthosis in 'real life'
- How does one measure user satisfaction during the course of a lifetime of orthotic use?

### 3. Is there a difference in quality management protocols between the industrial world and the developing world and if so what are they?

- No difference in philosophy!
- Service providers should be using a quality assessment system in both industrialised and developing contexts:
  - Country specific standards/products?
  - Linked to socioeconomic level of country: does staff salary effect motivation to comply to system?
  - Is the system being implemented
  - NGO/donor target aims? Quantity vs quality. Does the service provider have resources and control of quality

## Group C2 report

Chairman: Munazza Gillani  
Rapporteur: Christian Schlierf  
Participants:

Borgne	Kim Song Bo	Ruder
Bowers	Le Ha Van	Thomas
Dang Xuan Khang	Mey	Zelaya
DeMuth	Naik	Zhao Huisan
Gul	Robijn	

### 2. What information should be collected to determine the effectiveness of a lower limb orthosis?

Pre-, post-, follow-up data assessment:

- a. Standardized and systematic data collection.
- b. Use existing and simplified questionnaire formats (PT, prosthetics and orthotics, quality of life measures (SF36))
- c. Identification of goals in order to process data in the right direction

Functional assessment:

- a. Motion
- b. Pain
- c. Gait

Socioeconomic condition of the patient:

- a. Rehabilitation achieved?
- b. Employment?
- c. Cost effectiveness.

Social aspects:

- a. Social integration
- b. Quality of life
- c. Psychological assessment

Comparison between pre- and post-condition:

- a. Temporal statistics regarding mobility.
- b. How much the appliance is used? (acceptance of the appliance)
- c. Are predicted goals (treatment plan) and patient expectations met?

Evaluation done by independent observer (in follow-up) example from CSPO, ISO - 9001:2000.

### 4. Do orthotic services for the care of children with cerebral palsy in the developing world need to be improved. How?

- a. Parents/guardian education.
- b. Awareness-raising regarding orthotic intervention for the clinical team.
- c. Inter-disciplinary workshops and case studies. (ISPO supported)
- d. Specialised education for management of CP for the P&O and the clinical team ( e.g. 2 years specific CP training programme, Gujarat, India)
- e. Forming self-help groups:
  - parents to parents
  - patient to patient
  - peer group, etc.
- f. Mentoring and exchange programmes.
- g. ISPO database of CP case studies showing the statistics of qualitative and quantitative outcomes.
- h. Facilitate access to existing data bases and local experts, e.g. American Academy of Cerebral Palsy Developmental Medicine (AACPDMD.org )

## Group C3 report

Chairman: Vinod Krishnan  
Rapporteur: Aaron Williams  
Participants:

Blocka	Folcalvez	Nagels
Camacho	Hjelmström	Pokora
Canicave	Kelly	Watts
Dunleavy	Koll	Visser
Eboh	Kouma	

### 1. How does one measure user satisfaction after delivering a new orthosis?

Discussion centred around three topics:

- Factors that affect user satisfaction
- Types of information to collect
- Methodology and tools

Satisfaction is dynamic:

- Initial fitting
- Adaptation
- Acceptance (or rejection)

#### a. Factors that affect user satisfaction

Functional and aesthetic concerns:

- It works well, but looks bad
- It looks good, but works bad
- Dependant on patient age/social status/employment/etc.
- Cultural norms

Meeting of expectations:

- Patients ill-informed or misinformed
- Failure to discuss/set realistic goals
- Patient is shown how to maximize functionality of the orthosis
- Cost of device is agreed

Experience:

- A new patient has less experience:
  - may expect more
  - may expect less
  - has no point of reference
- Older patients have previous experience:
  - may be set in their ways
  - more demanding

Environmental and social factors:

- Employment
- Cultural acceptance
- Family

#### b. Types of information to collect

These fall into two categories:

- Patient's activity
- Patient's opinion

Patient's activity:

- Gives a measure of effectiveness of device
- Incidence of falls

- Function restored
- Onset of fatigue
- Lack of complications (pain, skin breakdown, etc)
- Return for repair/replacement
- Keeping appointments

Patient's opinion:

- Not just patient, but carer, family, peers, children
- Comfort/ease of use
- Ease to don and doff
- Does it help?
- Could it be better?
- Compliance (voluntary or enforced)
- Does it assist in participation?
- Aesthetics
- Patient mediated referrals

### c. Methodology and tools

It was felt that someone other than the orthotist/prosthetist should collect the feedback..

Patients should be reassured of treatment despite negative feedback.

Methodology and tool were considered under 4 headings:

- Questionnaires/forms
- Written correspondence
- Home visits
- Follow-up
- Simple chat

Questionnaires/forms:

- Literacy is an obstacle
  - Visual modes, need to be culturally appropriate.
- Interviewer bias/repeatability
- Environmental/social factors

Written correspondence:

- Direct written communication with the patient.
- Letters or questions to patient
- Letters from patient

Home visits:

- Either the orthotist/prosthetist/CBR/other
- Real situation of use
- Identify problems/successes

Follow-up:

- Patient returns to the centre for formal review of device and patient (with clinic team).
- Patient satisfaction can be gauged during this time

Simple chat:

- Perhaps the easiest to execute and quickest to see results (but how to document?)
- Ask about complaints
- Suggestions to improve
- Daily life - issues

## **5. Do orthotic services for the care of patients with post-polio paralysis in the developing world need to be improved. How?**

New cases of polio are decreasing, but "new" users are still coming forward. They are lifetime users with changing demands

Requires:

- 3 (or 4) As
- Creative designs of good quality
- Long term support

The 3 (4) As:

- Accessible
  - More centres in rural settings / CBR
  - Referral systems and integration of other professions
  - WHO / ISPO to champion these
- Appropriate
  - Individual designs / devices
  - Simplicity of designs
  - Materials currently are adequate, but variety and “hi tech” are limited
- Affordable
  - Materials used must be within local budgets
  - Cost recovery is only possible where patients have enough money
- Accountable
  - Follow-up
  - Preserve function long term
  - Patient advocacy

Creative designs of good quality:

- Standard designs may suit most patients, but some will require thinking “outside the box”
- Education
- Ensure schools teach problem solving
- Continuing education
- Peer communication/review/case study
- Supervision by appropriate person (Category-I)
- Encourage innovation / R&D

Long term support:

- NGOs should seek:
  - to fit into existing systems
  - Involvement of government
- Commitment from government
  - Infrastructure
  - Manpower
  - Finances

## Group C4 report

Chairman: Wilfried Raab  
Rapporteur: Peter Poetsma  
Participants:

Alaa	Kim San	Muller
Bhanti	Link	Schiappacasse
Haq	Museru	Steenbeek
Hasanovic	Möller	Sibila
Heagarty	Nguyen Hai Thanh	

### **2. What information should be collected to determine the effectiveness of a lower limb orthosis?**

#### a. User:

- Instrument to measure outcomes
- "Participation Scale" is a tool to measure disabled against a peer group. It includes social and economic elements and device acceptance, life improvement issues of daily living.

#### b. Professional:

- Instrument to measure outcomes.
- Follow-up: hours of use, distance, comfort, pain, problems, donning, doffing (same as prosthetics)
- expectation vs reality

### **4. Do orthotic services for the care of children with cerebral palsy in the developing world need to be improved. How?**

- Team building (team approach is compulsory) Pediatricians and maternity services included
- Educate all team members.
- Prioritize resources
- CBR identification and follow-up. (grassroots)
- Sensitizing the community, increase awareness and fight stigma.
- Advocacy.
- Low cost solutions?

## Group C5 report

Chairman: Norgrove Penny  
Rapporteur: Steve Mannion  
Participants:

Andrew	Kumar	Rodriguez
Eberle	Lastring	Sovann
Fang Xin	Endley	Trebbin
Ghosh	Nepali	Verhoeff
Khasnabis	Rechsteiner	

### 3. Is there a difference in quality management protocols between the industrial world and the developing world and if so what are they?

- Quality management (QM) reflects quality of service and product
- Establishment of QM protocols in developed world is regulated; in developing world arrangements are less rigidly defined.
- Often QM protocols not in place in developing world.
- QM protocols not required by statute in developing world.
- Barriers to QM time, money
- Overwhelming need/demand and lack of services leads to compromise in product quality
- Developing status not *excuse* for not having QM protocols
- Good QM leads to improvements in efficiency, cost effectiveness
- Influence of NGO/donor in implementing QM protocols
- Quality control of product output; fee per item vs quality output (check out protocol). In developed world quality check by insurance companies. Conflict between quantity and quality, therefore assessment system needs to embrace quality standards and ideally involve impartial, external assessment.
- Underlying importance of professional ethics and standards

### 4. Do orthotic services for the care of patients with post-polio paralysis in the developing world need to be improved. How?

- Always room for improvement, in both developed and developing world.
- Training and education, orthotist/prosthetist and patients. Transfer of technology, training workshops. Collaboration
- Change in focus; traditionally need has been for children, now childhood polio is decreasing, different need of adult / elderly population?
- Involvement of family, client support groups.
- Strengthening follow-up arrangements, CBR based? Rehabilitation services made available at local level.
- Funding for new technologies and materials - sustainability?
- Model (research) projects to assess "appropriateness" of new technologies?
- Involves multidisciplinary team, not merely focussed on provision of orthosis, identification, referral, orthotic, PT, follow-up.
- Awareness material, availability of services, maintenance of orthoses, all material in local languages. General health factors: diet, exercise.
- Availability of surgical services: to "fit" orthoses, or to be able to discard orthosis.

## Plenary discussion – Syndicates C

### Discussion

#### 1. How do you measure user satisfaction after delivering a new orthosis?

- Any satisfaction system for children can not be the same as that developed for adults.
- Two levels of follow-up. Direct patient follow-up and then the follow-up as part of quality management systems on processes etc. Suggestion that it is impractical to perform follow-up on all patients.
- We must remember that we first need to define what it is we wish to achieve.

#### 2. What information should be collected to determine the effectiveness of a lower limb orthosis?

A number of scales that already exist can be utilised.

- Can we establish a small sub-committee to investigate this tool, e.g. participation scales (available via WHO, ILF and ICRC)?
- One problem with the participation scale is that, if there are no base line details, it is very difficult to know how to handle the results. It is necessary to have a control group.

#### 3. Is there a difference in quality management protocols between the industrial world and the developing world and if so what are they?

Staff salary can not be linked in any way to quality measures:

- There is a minimum that you can accept in order to request quality service from your workers
- If rehabilitation is not given a priority then salaries will be quite low and service quality compromised.
- It goes beyond salary. There is also available of materials.
- There could be worker reward (salary increase) if they prove good outcomes.
- I think the salary debate is an excuse for people. Quality is something that in an organised society is achievable.
- In many countries the client doesn't dare to say to the supplier that they are not happy with the service.
- We must take care to ensure we understand what a quality management system is. The essence of QM systems is that there is process of constant review, self criticism and external criticism. We need to have general principles for continuous improvement.

#### 4. Do orthotic services for the care of children with cerebral palsy in the developing world need to be improved. How?

- Your group was in support for a specialised training programme
  - In India we have special programme on CP for special educators. These peoples are not prosthetists/orthotists
- Do schools have enough information to train their educators?
  - There is a lack of information to provide to people in schools.
- Reminder that the Global health website has a book on CP management.
- I am not sure that there is enough information and training available to prosthetists/orthotists in industrial countries
  - We should not forget that we only have a limited amount of time in the school.
- It would be difficult to put training information together for CP because there is not enough evidence available to confirm the benefits of orthotic management.

- One suggestion is to put together a case study package to show benefits, pre- and post-treatment. This is not scientific.
- Project Projimo (Hesperian Foundation) has put out a lot of very good resources on management of CP.

**5. Do orthotic services for the care of patients with post-polio paralysis in the developing world need to be improved. How?**

- Is there any attention or guideline that exists for the prescription of crutches? Often it is just the physiotherapist or orthotist that prescribes these. Could others do the job
  - Others could do it with just a little education.
  - There is a huge need for research into appropriate crutch design and manufacture in the developing world.

## Syndicates D

### Discussion questions

1. What kind of infrastructure is needed in order to have a successful Ponseti programme?  
*(Syndicates D1, D4)*
2. What are the lessons that have been learned from the Ponseti example to promote orthotics technology in developing countries?  
*(Syndicates D2, D3)*
3. What information, with regard to orthotic management, does a physician/surgeon need to know in order to write a useful orthotic prescription?  
*(Syndicates D1, D5)*
4. What information, with regard medical knowledge, does an orthotist need to know in order to provide the most appropriate device?  
*(Syndicates D2, D4)*
5. What should be the role of orthotic services in trauma management in developing countries?  
*(Syndicates D3, D5)*

## Group D1 report

Chairman: Robert Bowers  
Rapporteur: Maciej Pokora  
Participants:

Fisk	Naik	Williams
Henlein	Canicave	Ghosh
Pham Thi Hoa	Kelly	Endley
Tazawa	Link	Rodriguez
Gul	Poetsma	Nguyen Hong Ha

### 1. What kind of infrastructure is needed in order to have a successful Ponseti programme?

- Identified dedicated clinic / time for service.
- Accommodation (rehabilitation hostel)/travel funding.
- Registration of all patients under central coordinating body.
- Training of nurses/midwives etc. Education of parents, including using street plays (India), posters in public places.
- Assessment and follow-up, immediate and long-term, to avoid losing patients (effect of poor compliance on outcomes). Use CBR team if working well, or else identify who will see the patients regularly (i.e. utilize existing services, e.g. missionary, family planning, vaccination service, etc.).
- Government involvement (do not rely on NGO it may withdraw).
- Personnel resources needed (depends on local context):
  - Orthotist, physiotherapist, CBR worker or other person with appropriate training/skill for plaster cast application
  - Surgical doctor or accepted local medical practitioner for surgery; orthotist for (pre-fabricated) abduction orthosis: could be locally made or bought (e.g. from ICRC?).

### 3. What information, with regard to orthotic management, does a physician/ surgeon need to know in order to write a useful orthotic prescription?

Doctors in developing countries need to have a wider education than in developed countries. They need to self-direct their learning in the area of orthotics. Doctors act as the highest authority in the team.

Information needed:

- Biomechanical principles.
- Correct orthotic terminology (ISO).
- Prescription criteria for various orthotic types.
- Knowledge of the role of orthoses in the management of the problem.
- Expectations of the patient/parent/guardian, and their capability and motivation to use an orthosis.
- Limitations of locally available service:
  - Orthotic expertise, resources, materials, equipment, financial constraints.
- Cost of the orthosis.
- Awareness of cultural issues in communicating information effectively: e.g. unwillingness to admit incomprehension, limited ability to prioritise, etc.
- Must have a realistic understanding of general effects of orthotic service and rehabilitation advised, e.g. website: [global-help.org](http://global-help.org)

## Group D2 report

Chairman: Chapal Khasnabis  
Rapporteur: Aaron Leung  
Participants:

Francis	Kim Song Bo	Muller
Leung	Robijn	Raab
Pham Thuy	Dunleavy	Andrew
Tran Van Chuong	Koll	Nepali
Dang Xuan Khang	Visser	Sovann
Frank		

### 2. What are the lessons that have been learned from the Ponseti example to promote orthotics technology in developing countries?

- Based on sound anatomical and biomechanical principles
- A complete team involvement to achieve the final outcome ; orthopaedic doctor, PT, CBR personnel
- Need a whole package : funding, support from inside and outside
- Accessibility (should also facilitate accommodation of family members)
- Affordability
- Team: PT/orthotist to do casting, doctor, orthotist
- Mechanism for early identification and referral
- Early identification is also a crucial point for alternative approach
- Follow-up system
- Application of evidence based technique
- Simple and practical approach

How to introduce the approach to others not familiar with the approach:

- Vietnam experience: seminar at school, CD for information/review, participants were impressed and tried
- Implemented in an intensive approach to make it popular
- Good linkage between the community and service unit
- Ministry of Health involved
- Documentation of the progress
- Consensus/agreement among all levels even before start
- Follow/up to see long term outcome
- Promotion /awareness of the protocol for different parties
- Take the experience as a reference but the approach may not be applied in general
- The results of the Ponseti approach are more easy to show. This attracts the interest of the medical doctors
- Disability needs long-term intervention. It requires a long time for success

### 4. What information, with regard medical knowledge, does an orthotist need to know in order to provide the most appropriate device?

A medical doctor may not have sufficient knowledge to prescribe the appropriate device

An orthotist needs to know:

- Prognosis of the disease/pathology/conditions
- Precautions and contraindications
- Knowledge and skills of assessment, evaluation, and prescription criteria
- Function of various orthotic designs
- Clear understanding of the impairment and future biomechanical consequence
- Knowledge to decide when to refer the patient for medical/other consultation
- Knowledge and awareness of available surgical and therapeutic management which will help to facilitate orthotic intervention

- Orthopaedic/musculoskeletal biomechanics related to common types of pathological conditions encountered? Category-I/Category-II?
- Communication and dissemination of orthotic aspects of pathological conditions with doctors/surgeons
- Conduct workshop/seminar/course and invite doctors/therapist/other members of the interdisciplinary team to share knowledge and experience
- Ideally orthotics team at least has to involve a doctor and a PT
- Enhance knowledge on Functional anatomy and
- Basic pathophysiology, and its impact
- Self-learning skills

## Group D3 report

Chairman: Carolina Schiappacasse  
Rapporteur: Michael Rechsteiner  
Participants:

Long Hua	Ruder	Museru
Pierron	Zelaya	Kumar
Urseau	Eboh	Trebbin
DeMuth	Kouma	Sibila
Le Ha Van	Alaa	Nguyen Hai Thanh

### 2. What are the lessons that have been learned from the Ponseti example to promote orthotics technology in developing countries?

- Look into simple devices (forgotten technologies) as made in earlier years
- The presentations showed that the clinical team works
- Good political example to show (justify) the effectiveness of orthosis to sensitize donors
- Due to early detection, complicated treatment and complicated orthoses can be avoided
- Educate medical and paramedical staff in early detection of clubfoot or other conditions
- Weakness of the Ponseti technique (not an ideal example to be applied everywhere :
  - not applicable where there is no doctor (tenotomy)
  - need of strong follow-up
  - distance and costs
  - Strong communication between the clinical team and the parents needs to be emphasized
- Other professionals of the clinical team, as well as the parents, needs to be sensitized about orthotic management
- Lesson learned: to be more open to alternative techniques and new ideas
- Effective dissemination on methods like this should be emphasized (alerts us to the need of the diligence to stay abreast emerging techniques / practices

### 5. What should be the role of orthotic services in trauma management in developing countries?

- Role should be the same as in industrialized countries, but at more affordable prices. Orthotist should be involved immediately to facilitate trauma management pre- and post-surgery and to follow-up,
- To have in place emergency response protocols (tsunami, earthquake.)
- To stock and/or manufacture prefabricated devices or components (Mobility India) when appropriate.
- Education of the medical team members about indications and availability of devices and components as well as dissemination of information
- To be part of the team as a complementary role in trauma management
- Where there is orthopaedic surgery/emergency services, orthotic services should be available/accessible
- Promote creation of orthotic services where not available
- Training schools should include a specific curriculum dealing with orthotic management of trauma and disseminate the information to the rehabilitation team members, medics and paramedics

## Group D4 report

Chairman: Carson Harte  
Rapporteur: Christian Schlierf  
Participants:

McMonagle	Folcalvez	Eberle
Shangali	Bhanti	Lastring
Zhao Huisan	Kim San	Penny
Mey	Möller	Le Hai Ahn
Blocka	Steenbeek	

### 1. What kind of infrastructure is needed in order to have a successful Ponseti programme?

This question has been answered in the presentation of the last couple of days (ref Penny). We took the opportunity to think through some of the detailed issues.

Engagement with the government

Do Government/health ministries see clubfoot as a major problem?

- Yes. One of the largest birth defect issues.

Are governments engaged with the issue?

- When they are offered evidence and see it working in other countries they are very interested.
- Do governments need to be involved?
  - Yes. It may have a positive or negative impact on costing
  - Yes. They have access to infrastructure into which Ponseti can be built
- Alternatives to country wide plan:
  - Pilot project.
  - Dissemination and training centre
  - Regional hospital.

How are local surgeons involved?

- Not necessary, a physician will suffice.
- Local medical legislation will not allow non-doctors to perform even minor surgery.
- Tenotomy is not complex. Almost zero risk, but requires a competent and compliant doctor.

How are orthotists involved?

- They are not really required.
- Abduction orthosis is best fitted by a trained person possible, but not necessarily an orthotist.
- Orthoses sets can be mass produced and custom fitted.

Minimal requirements for functional service:

- Casting: PT/orthotist/nurse
- Orthosis: PO/shoemaker/factory
- Operation: Doctor

Ideal scenario:

- Training of medical/ technical team involved
  - Orthotist/prosthetist should be aware of full procedure
  - Conduct trainings/hands on workshops at regional/provincial hospital level
  - Develop education and awareness program through public health system
  - Institutionalization of method at the various schools (PT,OT nurse, doctor, orthotist/prosthetist)

- Awareness of population and medical/technical team
  - Identification
  - Technology
  - Treatment

Through governmental campaigns:

- Programme should be adapted to the opportunities of the country
- Strong argument towards the government
- Prevent disability. Clubfoot can be cured. This is quite different from most long-term orthotic treatments. It is a medical cure.
- CBR programmes
- ISPO could popularize the Ponseti method
- Functional referral system
- Availability of local health hospitals
- Supply of materials

##### **5. What information, with regard medical knowledge, does an orthotist need to know in order to provide the most appropriate device?**

- Level of knowledge depends on availability of team members
- Adhere to the existing standards of prosthetics and orthotics education; the level pathology/anatomy/biomechanics is appropriate and the standards are reasonable.
- The limits on decision making on the orthotist/prosthetist side is still unclear.
- Orthotists work in three possible scenarios:
  - In a clinic team, either close-knit or more informal. Will have good medical backup and the patient will have been given a full medical exam. Orthotist will make final detailed decisions re- prescription, but broad treatment objectives will be set by team.
  - In isolation, with broad referrals from a “first point of contact” medical infrastructure. S/he will have to take more responsibility and also will have to be very aware of when to seek support and help.
  - In isolation with no team. The orthotist is the first point of contact and will need to make a broad prescription and detailed prescription. Should have a solid knowledge of pathology, anatomy and medical conditions that could impact the rehabilitation or could be adversely affected by the orthosis.
- Making prescriptions. Indications/assessments
  - medical diagnostics are within the remit of doctors
  - if no doctor. is available, then orthotist/prosthetist should give recommendations and at a limit refer to the nearest available doctor
  - worst scenario, no doctor. available the orthotist/prosthetist will prescribe on own responsibility
- Range of assessment required in a 1 man team:
  - medical
  - physiological
  - psychological
  - social
- Individual orthotist/prosthetists should know at what level they refer responsibilities
- If the orthotist/prosthetist works in “isolated’ circumstances there may be ethical and legal limitations.

Question for the conference:

How can we increase the confidence in orthotists/prosthetists so they are more willing to take on prescription? The surgeons and medics happily admit they are not the experts.

## Group D5 report

Chairman: Elisabeth Thomas  
Rapporteur: Theo Verhoeff  
Participants:

Tardif	Camacho	Fang Xin
Watts	Hjelmström	Mannion
Borgne	Nagels	Krishnan
Gillani	Haq	Hasanovic
Mtalo		

### 3. What information, with regard to orthotic management, does a physician/surgeon need to know in order to write a useful orthotic prescription?

- The approach of physician / surgeon / other team members should be patient- (user-) centred
  - patient's expectations; living/working conditions, activities required, family's financial status, etc.
- The physician/surgeon should establish the diagnosis and the prescription.
  - condition of the limb etc
  - respect law requirements
  - MD's diagnosis/prescription mandatory in new orthotic services?
- Prescription can be general
- Prescription must address the functional deficit.
- Knowledge of types of available orthoses and respective functional outcomes which can be expected, requiring basic knowledge of:
  - biomechanical concepts
  - material characteristics
  - types of orthoses available in the region
  - price range of orthoses
  - respective functional outcomes of types of orthoses indications, contraindications
  - A common terminology or nomenclature
  - A concise information document for physician / surgeon may be helpful.
- Team approach: orthotist/prosthetist, PT, MD
  - participation of MD in check-out system enhances user satisfaction

### 5. What should be the role of orthotic services in trauma management in developing countries?

- What is trauma? WHO: RTA. Injuries
- Role of orthotic service in acute trauma management is generally very limited.
  - Post-traumatic fracture bracing etc. is usually done by MD in hospital
  - Sport trauma injuries: not considered a priority
  - Post-traumatic emergency treatment; pragmatic approach. Means are flexible (local appliance versus high tech appliance).
  - Availability of pre-fabricated orthoses in hospital.
- Use of orthoses in cases of non-union of lower limb is usually not very effective for union. Relief?
- Role of orthotic service for spinal cord injured patients to be considered.
- Prioritising. With limited resources, prioritising of funds/services to patients is an unavoidable process, also in the West.
- Public health approach: populations versus individuals. Reality on the ground: ethical dilemma. Pragmatic approach.

## Plenary discussion – Syndicates D

### Discussion

A member of the audience suggested that we can't rely too much on NGOs as they may pull out. NGOs were considered important however in initiating projects, setting them up and showing leadership.

The question of what can we learn from Ponsetti experiences was discussed. It was recommended that NGOs start these initiatives but that they should be sustained by Government.

In Vietnam, NGOs are involved in the roll out process. Any new concept however will need to be approved from higher up. A question was raised if WHO has a position on this and can they help convince the Ministries of Health. The group was of the opinion that NGOS alone will not be able to push thru the system.

The experience from Malawi is that it is extremely important to set up appropriate training. The technique is simple but radical and people MUST be trained. A country club foot committee was recommended to facilitate this..

In Cambodia there are 800 cases of club foot per year. It was suggested that it is easy to convince the government to provide assistance in this issue as the numbers are the same as for landmine accidents but the intervention comes at a fraction of the cost.

Two problems were highlighted; initiative and sustainability. Governments are not good at initiating new things. Sustainability with government is very difficult as well. Norgrove Penny indicated that a team approach essential.. No surgery is possible without it. Sometimes the tenotomy is incomplete. There have also been cases of extreme bleeding and infections. He also suggested that orthotists can be the champions for this method.

In relation to the question of orthotic services in trauma management it was indicated that the orthotist should be active in setting up emergency splinting in cases of SI or fracture.

Spinal trauma was recognised as a very big problem. Participants considered what can orthotically at early stage in these cases. A trauma meeting was mentioned and ISPO involvement considered important.

Bakht Sarawar questioned the roll of Orthotist in non-union fractures. While a cast or orthosis was considered useful in humeral fractures and in cases of congenital pseudarthrosis, the best treatment was considered surgical.

Gordon Ruder questioned the emergency response teams in place in many countries. Is there emergency response and are prefabricated orthosis available for emergency situations. Steve Mannion suggested that this was a good idea. PIPOS has experience in this and indicated that coordination of local services is vital

## Syndicates E

### Discussion questions

1. What is needed to raise the level of care of patients with neuropathic (insensate) feet?  
*(Syndicate E1)*
2. What steps should be taken in order to provide appropriate orthotic services to patients with neuropathic (insensate) feet?  
*(Syndicate E1)*
3. Describe your experiences in using the ISPO/USAID protocol on cost calculation.  
*(Syndicate E4)*
4. What needs to be done to promote and improve orthotics technology in developing countries?  
*(Syndicate E4)*
5. Discuss the need for new componentry and materials for use in orthotics in the developing world.  
*(Syndicate E4)*
6. What is required to improve the level of the orthotic management of stroke patients in developing countries?  
*(Syndicate E2)*
7. What steps should be taken to meet the need for orthopaedic footwear in developing countries?  
*(Syndicate E3)*

## Group E1 report

Chairman: John Fisk  
Rapporteur: Nancy Kelly  
Participants:

Penny	Nguyen Hong Ha	Khasnabis
Schlierf	Hasanovic	Eboh
Eberle	Watts	Mannion
Folcalvez	Sibila	Robijn
Museru	Kouma	Steenbeek
Raab		

### 1. What is needed to raise the level of care of patients with neuropathic (insensate) feet?

#### Awareness

- Increased awareness on part of general population – use existing structures of MoH for this, with emphasis on early detection and causes (especially of diabetes)
- Role for care providers in increasing awareness of role of orthotics in management of neuropathic feet – through assessments,
- orthotists; medical society, CMEs, primary schools,
- ISPO Task Force to work with various networks?
- patient education - need common sense approach, specific instructions
- Various levels of education needed – general public, patients, families, providers, orthotists

Leprosy programmes tend to be well organized on national basis

Diabetes is growing problem, many NGOs have clinics to serve this patient population, surveillance is important in management of this disease

#### Strategies:

- Use end-user groups that focus on diabetes and leprosy for advocacy and information
- Leprosy should be incorporated into clinical medicine

### 2. What steps should be taken in order to provide appropriate orthotic services to patients with neuropathic (insensate) feet?

- Referral system to physician important but not all know how to care for wounds
- Sub-specialization – results in MDs not feeling comfortable outside of what they know/do daily
- Information on wound care:
  - Healing of ulcers – knowledge exists, handled by surgeons, teamwork, need diagnosis by MD, casting by orthotist/prosthetist, local care
  - Need to collect information that already exists with focus on insensate feet with distinction between diabetes, leprosy
  - (book – Essential Actions in Leprosy, Jean Watson)
  - Agreement: Education for Category-I and II needs to be improved in this area
  - Foot impressions – pressure surface evaluations as part of orthotic evaluation

#### Technology:

- Weight relieving orthosis (total contact) not being used in developing countries (can this be shared with prosthetics/orthotics schools?)
- Podiatrists – is losing turf to them an issue?

- Shoemaking: not part of school system, need to raise profession of shoemakers and expand their knowledge, more are needed, they do not have much status
  - Resolve: higher status, recognition, certificate/diploma level for shoemakers
  - Can some element of shoe maker be incorporated into PO training – but it may not have high priority
- Aircast walking boot might be appropriate technology
- Local products
  - shoes in the market: more cosmetic, work as well

## Group E2 report

Chairman: Robert Bowers  
Rapporteur: Gordon Ruder  
Participants:

Sovann	Le Hai Ahn	Zelaya
Frank	Verhoeff	Dang Xuan Khang
Schiappacasse	Rodriguez	Koll
Alaa	Bhanti	Dunleavy
Francis	DeMuth	Andrew

### 6. What is required to improve the level of the orthotic management of stroke patients in developing countries?

There has to be recognition of existing systems/structures, once you have identify the decision makers at the national (Ministry of Health, Social Services) and hospital level, then you target them first.

Identification/recognition that by neglecting stroke patients, the overall cost is far greater.

Education:

- of orthotists in their schools that includes user behaviour/cognitive, pathology, biomechanics, gait, other members contributions, etc
- further specialization once in the field at a multidisciplinary format (PT, Drs, nurses, etc).
- of patient/user and their family/care givers/CBR workers at discharge and follow-up.

Public, medical team, family members/care givers awareness of orthotic management of stroke.

ISPO to provide visual case studies illustrating the benefits of proper rehabilitation vs incomplete/compromised rehabilitation. To be used in schools, providers, and users. In the format of pamphlets, digital multimedia sources.

Refer to the ISPO stroke consensus report

In particular:

- Appropriate technology with low cost intervention that results in the best orthosis for the user. Focus on prioritizing treatments to assist users when you will have the greatest effects, minimize treatments for those that are functional ambulators that have a reasonable quality of life (pain, safe, endurance). Simple solutions (elastic straps, prefabricated orthoses) will only work for simple problems (weakness vs significant spasticity; swing phase vs stance phase).
- Applied biomechanics and gait, and clinical experience are required.
- To identify when orthotic intervention should start, most feel that the earlier, the better. (once the patient's vital health concerns have stabilized, out of Intensive care) preventative components of acute care that is cost effective (prefabricated orthoses, pressure sore and contracture management)
- Nothing will work unless the team, hospitals, public buy into the concept.

## Group E3 report

Chairman: Olle Hjelmström  
Rapporteur: Dan Blocka  
Participants:

Hjelmström	Tran Phi Tuoc	Nguyen Hai Thanh
Canicave	Nguyen Lan Anh	Nepali
Pierron	Gul	Pham Thi Hoa
Möller	Williams	Pokora
Kim Song Bo	Le Ha Van	Kim San

### 7. What steps should be taken to meet the need for orthopaedic footwear in developing countries?

#### Planning/Implementation of the service

- proper planning in setting up the service
- interaction/coordination between those providing service
- proper recognition of the service - government, professionals, payment?
- match with cultural and geographical aspects of the region
- quality assurance to ensure there is a check-out of the service
- financial resources to initiate the service
- make users aware of the service
- possibly find other strategies outside of just custom orthopedic shoes and use existing designs of footwear that can be modified
- educate those in the remote area to support a more central service or make sure there is some sort of outreach service

#### Develop human resources

- Coordinate education from the qualified OSM to those with fabrication specialties (scheme of qualified personnel)
- attract at least one professional that is trained or can be trained to the level of a orthopaedic shoemaker
- attract those with existing & appropriate skills to this area, such as leather workers or similar
- train at appropriate levels and numbers to have proper manpower to provide service
- ensure expertise to treat clinical conditions/pathologies that are present

#### To source technical capabilities and raw materials

- is the technology available?
- are the materials available?
- if not, then source materials required to provide the service
- match the service with cultural and geographical aspects
- if possible, combine with existing orthotics and prosthetics services

## Group E4 report

Chairman: Sepp Heim  
 Rapporteur: Jo Nagels  
 Participants:

Kumar	Tran Van Chuong	Stills
Long Hua	Pham Thuy	Mey
Harte	Naik	Krishnan
Urseau	Borgne	Sarwar
Poetsma	Thomas	Trebbin
Tardif	McMonagle	

### 3. Describe your experiences in using the ISPO/USAID protocol on cost calculation.

Comments on independent experience not ISPO/USAID related

VietCOT:

- cost calculation integrated into clinical work of 3 year education course
- Swiss NGO, VietCOT for 200 child devices cost calculations after delivery
- calculations sent and considered by up to 9 centres (government and private), via GTZ consultant, with positive feedback Might be basis for future refund.

PIPOS:

- 2 credit hours in cost calculation
- Full-time purpose reflect in increased human resource expenses

UDB:

- comprehensive internally developed cost calculation is used

India (Impact):

- comprehensive internal cost calculation tool is used

HI:

- centres have own tools hard to change
- implementation in new centres
- language barriers with existing cost calculation tools

Motivation:

- VietCOT/GTZ model followed
- who should implement the tool: the accountant
- problems: no connections between the salary and labour time, how easy to calculate labour time?

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>- Same tool used everywhere, common data</li> <li>- assessment tool</li> <li>- tool where financial responsibilities can be discussion with governments, allowing financial projections</li> <li>- various admin and services on a percentage base, including individual projections, depreciations</li> <li>- know-how of cost of device will lead to better management</li> <li>- <u>all</u> relevant costs are included</li> <li>- specific department costs</li> </ul>	<ul style="list-style-type: none"> <li>- not user friendly coding</li> <li>- not user friendly manual</li> <li>- no timely updated versions</li> <li>- add-ons not displayed</li> <li>- overhead costs not shared</li> <li>- hard-copy manuals</li> <li>- extra financial and manpower input</li> <li>- no follow-up</li> </ul>

<b>Opportunities</b>	<b>Threats</b>
<ul style="list-style-type: none"> <li>- based on previous success, next wider version</li> <li>- link patient data base, store management</li> <li>- profits can be adjusted/calculated</li> <li>- centre cost calculation</li> <li>- include in schools will allow progress and integration of the tool, all the way to government institutions</li> </ul>	<ul style="list-style-type: none"> <li>- incomplete data may reflect incorrect price</li> <li>- implementation of too big data base</li> <li>- disciplined coding</li> <li>- recommendations:</li> </ul>

Recommendations:

- overall it is a positive tool
- timely distribution of latest version
- registered web download updates
- introduction short training
- offer a training possibilities to centres
- more user friendly manual
- part of the curriculum in all schools
- follow-up to improve the system
- ISPO web page as a forum

## Group E5 report

Chairman: Eiji Tazawa  
Rapporteur: Aaron Leung  
Participants:

Fang Xin	Zhao Huisan	Rechsteiner
Henlein	Camacho	Lastring
Muller	Mtalo	Visser
Ghosh	Endley	Haq
Link	Gillani	

### 4. What needs to be done to promote and improve orthotics technology in developing countries?

- There are different situations from place to place. There is a need to identify the government's initiative and activity of the NGOs. There are comments that in some developing countries orthotic/prosthetic services service are only lead by private sector.
- Promotion and improvement need to be worked with the government structure. Existing local strength/situation must be identified, so that additional appropriate external support can be applied.
- Initiation can be from NGOs with government. Communication among Ministries is essential. Affordability, Availability, Accessibility of the required service have to be demonstrated to the government and need to be applied fast.
- Multi-activities, e.g. training course to support/subsidise patient service
- How to enhance the status of rehabilitation?
  - Team approach
  - Link with CBR, e.g. Red Cross branches and other NGOs
  - Outreach programmes
- Focus on clinical part and let the manufacturing part to be taken up by other industries?
  - To have input from professionals of manufacturing industry for product development
  - Local supply of materials and components with reasonable price
  - Quality of local products

### 5. Discuss the need for new componentry and materials for use in orthotics in the developing world.

- New approach and method to be designed
- Different technological options should be considered
- Patient specific
- Good knowledge about the process, e.g. health and safety (PVC generates toxic material under high temperature)
- Needs also come with improvement of economy of certain class of people

## **Plenary discussion – Syndicates E**

### **Discussion**

It was observed that many countries already have shoemakers and it was suggested that they might be upgraded by including some orthotics in their training.

Germany has a seven step check list for the care of the diabetic foot. Is there a need to develop an international check list?

There was some concern about getting shoemakers to make orthopaedic shoes. In France the education for orthopaedic shoemakers is 4 years. Cutting corners will only create problems.