

**SECTION 9:
EQUIPMENT &
ASSISTIVE
DEVICES**

EQUIPMENT/ASSISTIVE DEVICES

As AHPs we use assistive devices to support the habilitation and rehabilitation of individuals with disabilities. These range from a wheelchair, to a communication aid, to a means of enabling someone to be fed or toileted.

So whether you are a Speech and Language Therapist, a Physiotherapist or an Occupational Therapist, this section will have something for you.

The use of equipment and assistive devices by AHPs is dependent on clinical need, the training, experience and imagination of the therapist, but is also critically determined by supply and appropriateness. That is, it is context dependent.

In the West we are used to professionally designed off-the-shelf equipment often supported by state provision. In low-resourced situations assistive devices are often not available; in addition, western equipment may not be appropriate. For example lightweight wheelchairs are not robust for stony terrains in rural Africa or Asia.

Therapists need to find other means of provision.

The importance of equipment provision is now being recognised

In recent years, the right of people to equipment and the inadequacy of supply has received high level recognition.

The World Health Organisation recognises that “Assistive technology is the tool, and often the first step to ensure people with disabilities are equal beneficiaries of and contributors to any development process”.¹

“It estimates that only 1 in 10 of those who need an assistive device have access to what they need. This is particularly the case in low resourced settings. Production is low and

often of limited quality. There is a scarcity of personnel trained to manage the provision of such devices and technologies”

In low and middle resourced countries, only 3% of the population in need have access to hearing aids.

http://www.who.int/phi/implementation/assistive_technology/global_survey-apl/en/

The United Nations in “The Convention on the Rights of Persons with Disabilities” has now recognised access to assistive technology as a human right and has called for international cooperation to improve its access (Article 32).”

In response, the “WHO is developing a flagship programme – **Global Cooperation on Assistive Technology (GATE)** – in partnership with UN Agencies, international organizations, donor agencies, professional organizations, academia, and organizations of and for persons with disabilities.

Government and non-government agencies from around the world are collaborating with the WHO to:

- develop national policies and programmes on assistive devices and technologies with a focus on human resource development
- create a database on availability of appropriate assistive devices and technologies.

As AHPs working and supporting work in low and middle income countries we need to be aware of these initiatives and work together with them.

In 2016 the WHO produced the **Priority Assistive Products List**. This defined 50 priority assistive products. They are regarded as an absolute necessity to maintain or improve an individual’s functioning and which need to be available at a price the community/state can afford.

http://www.who.int/phi/implementation/assistive_technology/en/ (accessed [12/07/17](#))

A recent study evaluating a training programme for mothers of children with Cerebral Palsy in Ghana found that assistive devices such as bespoke chairs or standing frames, enhanced the caregivers' ability to work, and facilitated social inclusion for the child, in play, school and within the family and community. The equipment also promoted the child's development by, for example, improved mobility, trunk stability and head control. However, there was dissatisfaction at the sizing and durability of the devices and while they were considered valuable, a third were not being used because of problems.

<http://disabilitycentre.lshtm.ac.uk/files/2014/07/Evaluating-the-impact-of-a-community-based-parent-training-programme.jpg>

Provision of equipment and assistive devices in low-resource contexts

While the GATE programme is extending supply, it will take time before equipment and assistive devices will be routinely available and in the meantime AHPs will continue to need to find alternative ways of ensuring provision for our clients.

Key issues identified around the use and availability of equipment and assistive devices

Assessing the clinical need for an assistive device does not change with geography, **however** selecting and providing a device which will be appropriate to the cultural, physical and economic environment, is context dependent and subject to....

- **Availability of supplies that are already in existence locally.**
- **Awareness of their use and value**
- **Sufficient means for monitoring, to allow for growth in the case of children, and to avoid pain, and discomfort.**
- **Sustainability of supply**
- **Suitability in terms of 'fit'- economic, cultural and with regard to the physical environment**
- **Durability, spare parts and facilities for maintenance and repair**

Affordable equipment can sometimes be found locally

It is always worth asking around to find if there are items available in local shops and markets that may also be suitable

Often everyday items available in clients' homes may be suitable or can be adapted. For example,

- Plastic cups may be lighter weight and have larger handles for people with impaired hand function.
- Many countries have a favourite national board game which can be used to develop fine-motor co-ordination skills or to aid communication, and enable social and cognitive retraining.

Certainly, items bought locally have the advantages of being familiar and culturally appropriate, they blend in, are easily replaceable and more affordable. Many items will be suitable, but not all. It is important to consider critically the construction and type of materials used with respect to safety. For example, small parts could come adrift and become choking hazards for infants and small children.

Sustainable Availability

The issue of sending rehabilitation equipment overseas is a constant source of debate as AHPs and their associates are faced with the pros and cons of being involved in sourcing, sending, using, adapting and maintaining equipment in the International setting.

Importing equipment or assistive devices or the materials to make them relies either on donors or on contracts. Donors may or may not be able to sustain supplies in the long term. Imported items may be subject to customs and duties and take a long time to obtain.

The debate therefore, around 'Should we send equipment abroad?' is not a straightforward issue and the answer to the question is probably – it depends on the context.

The type of international activities that attract donations – not only equipment – is complex and links with voluntary and non-voluntary sectors, including the humanitarian and private sectors, with varying commitments and time lines, which need to be reflected on in this debate

There are western non-government organisations that recycle and supply equipment. This can be a useful and more sustainable source but thought must be given to when the

equipment is, or is not, appropriate to the socio-cultural and physical environment in which it will be used. **PhysioNet** is an organisation which recycles assistive devices for low and middle income countries, assistive devices such as wheelchairs, walking frames or Pedro boots for children <http://www.physionet.org.uk/>

Every year at the ADAPT conference, the participants have a debate. In 2014, their debate focused on whether we should be sending equipment abroad. Whilst this was directed at physiotherapists, the comments are relevant for all health care professionals

Debate: Should we be sending Equipment Overseas?

The next 2 examples were used to help address this debate.

CBR Setting

An organisation had been working with the Ministry of Health to develop community rehabilitation services for children with differing disabilities in the town and surrounding villages, mainly with mobility and communication difficulties. National rehabilitation services had been institutionalised in 2-3 special centres where children with disability and caregivers attended an intensive set of physiotherapy sessions focusing on passive exercises, wax and electrotherapy. The children returned home to continue some basic exercises without any mobility aids to develop their balance, standing or walking skills. With the donation of models of corner chairs, wedges, K walkers, Pedro boots, leg splints etc., the local staff were trained to assess and measure a child for the use of the equipment and then use local materials to make this basic equipment to support the children's development. Then the parents were encouraged to also copy the relevant equipment to use in the home setting.

Emergency Setting

After an earthquake, 5 containers of adult one size wheelchairs arrived in the affected area sent from abroad as a donation to support the injured and disabled to a small community NGO. The donation was very welcome as people were in desperate need. The distribution of wheelchairs was a challenging activity as none of the staff were trained to assess, measure or know how to use them. So wheelchairs were given out as soon as they identified people with mobility needs. Clearly many of the wheelchairs were not well suited for the individual, being too wide or long and high for the person to be able to use it as a mobility aid. None of the wheelchairs were suitable for children or for people with complex injuries, such as SCI, TBI, persons with double amputee and these people remained isolated in their tents and shelters.

PROS & CONS OF IMPORTING EQUIPMENT

PROS

- If one piece of useful equipment is provided, it can be copied locally and reproduced using local materials
- Clinically for local staff it opens up and/or strengthens a greater number of treatment options
- Improves the quality of life for people that otherwise they wouldn't have.

CONS

- Equipment has the potential to do more harm than good if people are not clear how to fit/use or maintain it.
- Not a sustainable process as donations tend to be random and not based on demand from the LMIC
- Often delivery and distribution of equipment is coordinated by a non-technical person
- Better to support the local economy and resources in LMIC.
- Many children and adults need continued provision of specialised equipment so providing on a one off basis is not a useful solution

Suitability in Terms Of 'Fit'-

Economic, Cultural and with regard to the Physical Environment

Is the item or the materials from which it is made, affordable for families and services locally?

Western supplied equipment will be too expensive for many families. However, there are communities in most countries who can afford high end equipment and private hospitals which can provide it.

There are in some countries well-established and well supplied prosthetics workshops, however it can be difficult to obtain supplies of thermoplastics for hand splinting.



Plaster of Paris can be an alternative splint-making material.

Wood for construction is often available, yet in many low and middle income countries posturally supportive wooden chairs are still too expensive for many families. The wood used is often hard wood which can be difficult to work and heavy. An alternative approach for posturally supportive seating is so-called **Appropriate Paper Technology (APT)** made of recycled cardboard. The resulting assistive devices can be made to meet the most complex postural needs of children with cerebral palsy, the devices are robust and cheap, however the techniques need to be well learnt and production can be time-consuming. Future training programmes for assistive device provision should recognise the role of postural management to enhance participation, ease parent handling and contribute to development, as well as helping combat weakness and the development of postural deformity. Follow up should include monitoring of pain or discomfort and adjustment of the assistive devices as the child grows and develops.

Examples of equipment for children with cerebral palsy using APT



Supportive Adapted Wheelchair



Standing Frame



School Desk



Supportive adapted chair

Information about APT including courses in the UK for therapists to learn the method is on the People Potential website. <http://www.peoplepotential.org.uk/appropriate-paper-technology>

Is the item or material suitable for the immediate environment?

APT items will need to be kept indoors when it's wet.

A home visit will ensure that there is space in the home for an item.

The visit will confirm whether there is somewhere appropriate to put the item, for example to prop an inclined standing frame.

Western wheelchairs may not be sufficiently robust for the stony, uneven terrain of rural Africa and Asia and won't last. A range of wheelchairs has been designed specifically for these environments and supply mechanisms have been established.

Motivation is a British non-government organisation which has pioneered the design of a range of wheelchairs suitable for low and middle income country contexts.

<https://www.motivation.org.uk/>

When selecting an appropriate wheelchair, consider the user's lifestyle and environment. Srinvas' hospital transfer chair didn't last long on the uneven ground around his home. Today, he uses a Motivation Rough Terrain wheelchair to help farm his land. Wheelchairs providing postural support for children with cerebral palsy can enable function and help prevent deformity.



© Motivation

The World Health Organisation has produced in-depth information on wheelchair provision for low and middle income countries, covering assessment, design, supply and training.

<http://www.who.int/disabilities/publications/technology/wheelchairguidelines/en/>

Can the device be maintained and repaired?

If an assistive device cannot be repaired or replaced, the user will have been enabled for a short time, only to then tantalisingly lose that newly experienced independence.

Donated chairs from industrialised countries tend to break easily in the rough conditions in most developing countries. Replacement parts are usually not available locally.

Some assistive devices by their nature will have a limited life. An example would be pressure relieving cushions which cease to have therapeutic value as they wear out. Equipment which falls into disrepair can become useless or dangerous, such as hoist slings, wheelchairs or hoists. It is important that the users of assistive devices and the therapists providing them have the information to recognise these limitations. The therapists may decide it is better to avoid certain items.

Repair requires a supply of the right spare parts and know-how. Some hospitals have workshops which could undertake repairs and some basic repairs can be done by local artisans, e.g. a bicycle repairers, carpenters or tailors, with appropriate training.

Standard battery powered devices and toys may not be feasible to use.

In general, it may be better to avoid sophisticated equipment which local personnel are not familiar with and where spare parts and the know-how to repair them are not available.

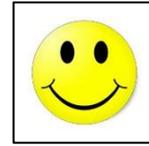
Two excellent resources which between them discuss further, issues around using and making equipment and assistive devices are

- **D.Werner “ Nothing About Us Without Us”**
- **V.Alers, R.Crouch “Occupational Therapy an African Perspective”**

See Resource Section

Is the item culturally appropriate?

We use pictures to communicate when teaching and in communication devices. However, the pictures will be based within a cultural context. We may think, for example, of using a smiley face picture to communicate or reward success in therapy, yet it may not be understood everywhere.



Likewise, drawing a star as per the Israeli flag will not be culturally appropriate in the Arab world.

It is all too easy to assume that something will be understood and acceptable.

We need our host colleagues to help us understand what is and is not appropriate.

Designing and making equipment and assistive devices locally – make it yourself!

With imagination, it is possible to make very effective aids for daily living and posturally supportive seating using locally available materials and even waste products. Appropriately designed, locally made equipment and assistive devices can be more suitable culturally and more sustainable in terms of the environment, supply and maintenance.



A waste plastic bottle used to make it easier to turn a tap on and off, for people with weak hands.

An African OT once pointed out that if we think differently we can recognise more of what is around us as being of therapeutic value. For example, she suggested using cold porridge for tactile stimulation.

For assistive devices made of wood or metal, such as a corner seat or seating adaptations, local artisans, carpenters, metalworkers and tailors, can provide advice on suitable materials and construction methods.

In our experience artisans who have been involved in the design and making of an assistive device very often continue to supply equipment on an ongoing basis, providing a new supplier to the local AHPs.

Ensuring equipment and assistive devices will be used!

- Explaining the purpose of the assistive device and so bringing it into regular use by an individual or caregiver is a critical component in the provision of assistive devices and equipment, which is often overlooked.
- Equipment and assistive devices may not be used if their use is ill- understood or considered culturally inappropriate by a family.
- Host colleagues are likely to be able to give guidance about possible barriers to acceptance.
- Home visiting always helps
- It is important to talk through and check perceptions and expectations of what a piece of equipment are for and how it can be used with the user or caregiver. For example, we may assume that parents play with their children but in some communities, it is not usual for adults to play with children.
- If local therapists and therapy assistants are familiar with newly introduced equipment and assistive devices they are more likely to 'Own them', recognise their role and use them in the longer term.

Outcome Measures

We need to monitor the usefulness of our services and of the role that assistive devices play. There are now tools for this:

In relation to children

- Ryan et al (2006) The new Family Impact of Assistive Devices (FIATS)
- Chiarello et al (2016) Child Engagement in Daily Life: a measure of participation for young children with cerebral palsy.

In relation to Adults:

- The Canadian Occupational Performance Measure (COPM) <http://www.thecopm.ca/>

Key Messages:

- **Access to appropriate assistive devices is now recognised as a key priority for individuals with a disability.**
- **Suitable assistive devices and equipment may be available in-country. Encourage information sharing on locally sourced low-cost Aids.**
- **Where unavailable, they can be designed and made locally through collaboration between local and overseas therapists, users, caregivers and local artisans.**
- **Ensure the equipment is appropriate and safe to use and can be maintained.**
- **Ensure there is a training process in place.**
- **Most importantly - work together with recipients**