

Hoist and Sling

selection guide



Contents

Hoist and Sling selection guide	01
1. Introduction	02
1.1. Safe Patient Handling	04
1.2. PEO model	05
2. Active transfers	06
2.1. Active lifters	06
2.2. Slings for Stand Assist lifters	06
3. Passive transfers	07
3.1. Mobile floor hoists	08
3.2. Ceiling hoist systems	09
3.3. Spreader bars	10
4. Slings for passive transfer	12
4.1. Selecting the right sling model	13
4.2. Sling shapes	14
4.3. Selecting the right size	15
4.4. Fabrics	18
4.5. Choosing the right loops	19





1 Introduction

► This resource is designed to help you assess a suitable hoist and sling for your client. All assessment and equipment selection needs to incorporate balanced decisions. Elements include: client need, the physical environment, as well as the needs and capability of the person that will operate the equipment.

1.1. Safe Patient Handling

► When should we consider using a hoist?

- If manual handling is too heavy
- If there is a risk of injuries to the client or carer(s)
- To keep the client active longer

Safe patient handling involves the use of mechanical equipment and safety procedures to lift and move clients so that health care workers can avoid using manual exertions and thereby reduce their risk of injury. The right selection of equipment can reduce the number of carers required for client moving and handling.

► Avoiding accidents & injuries

Throughout Europe, Governments aim to reduce the risks to clients and carers alike via legislation. Check the regulations in your country to ensure compliance.

► Client

The most important criteria when considering a suitable solution is the client's mobility level as this indicates their level of body control. The various products available in the market are designed to give support in those areas where body control and muscle tone are reduced.

To narrow down the equipment decision, we can assess the client's control of four different body parts:

- Legs / weight bearing capability
- Hip control
- Trunk control
- Head control

Body Control assessment



Good



Limited



1.2. PEO model

It is important when choosing equipment that we remain holistic, by using a framework alongside a standardised risk assessment to help inform and guide us towards choosing appropriate types of equipment.

Law Et al (1996) state that a person's ability to carry out their occupations, is determined directly by the balance between themselves as a person and their environment.

▶ **Person**

An individual is more than just their weight and height (load). Consideration needs be given to their degree of physical, emotional and psychological autonomy. This includes elements such as:

- Upper and lower limb strength or range of movement
- Posture
- Skin integrity
- Emotional or psychological needs
- Hip stability

▶ **Environment**

We also need to consider anyone or anything that interacts with or impacts the environment such as:

- Carers, family and friends
- Physical environment
- Equipment
- Health care professionals

▶ **Occupation**

These are the tasks that are being completed both by the person being transferred, care giver or personal assistant. It can often be overlooked that the person being transferred can actively engage in elements of the process and therefore maintain some form of control, so it is critical to consider what is meaningful to them when completing the assessment.

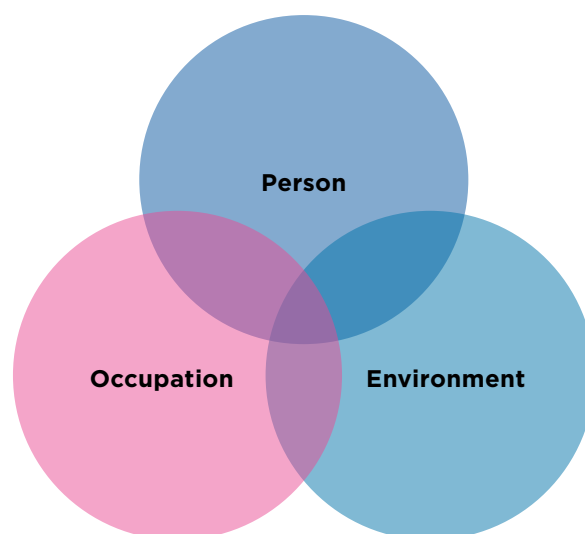


Figure 1: Representing each component of PEO Model.

Reference:

Law, M., Cooper, B., Strong, S., Stewart, D., Rigby, P. & Letts, L. 1996. The Person-Environment-Occupation Model: A transactive approach to occupational performance. *Canadian Journal of Occupational Therapy*. 63(1):9-23

2 Active transfers

2.1. Active lifters

Active lifters, also known as stand assist lifters or raising aids, are used to support a person into a standing or semi-standing position for transfers or rehabilitation exercises. They depend on the client being actively involved in the transfer. The client must have some strength in the quadriceps and gluteus muscle groups, in order to participate in the manoeuvre.

Stand assist lifters provide safe, comfortable and mechanical assistance from one seated position to another for people who have limited mobility and/or rehabilitation needs.



2.2. Slings for Stand Assist lifters

Commonly, there is a choice of two types of sling that are compatible with Stand Assist lifters.



Stand Assist Sling

- ▶ Can be used with people who have some weight bearing ability, good trunk control and ability to hold onto the lifter. Can be used for seat to seat transfers or depending on the model, assist with walking.

Transfer Stand Assist Sling

- ▶ The sling is fitted with additional sections and is useful for people with less standing ability, risk of falling or reduced trunk stability.



Avoid sliding in the sling

It is very important to select the correct size sling and ensure that the client leans backwards when being lifted.

3 Passive transfers

► Mobile floor lifter

Mobile floor lifters work in many environments and are, in most circumstances, very effective. They provide flexible movement so that transfers can be facilitated from anywhere in the domestic or care environment.

Standard equipment can be acquired at a lower cost than a ceiling hoist system, but have limitations regarding the fit between person, environment and occupation (PEO model):

- required floor space to manoeuvre
- a higher lifting range is sometimes required
- plus sized clients may exceed the width and/or the safe working load of standard equipment

► Ceiling Hoist Systems

A ceiling hoist system overcomes those limitations of a mobile floor lifter and is therefore easier for care staff to use; improving the fit between the person and their environment.

By improving the fit between a person and their environment, it can be easier for them to carry out their daily tasks such as accessing the toilet, leisure activities, being able to sit outside, or be hoisted into a wheelchair for day trips. It also increases the option of a family member managing care or even a single-handed care package.

Before selecting a hoist, consider the client's anthropometrics, body shape, size and weight as well as the environment in which the equipment is being used.



3.1. Mobile floor lifter

Different lifter models to match different needs for the environment or the person being transferred

- ▶ Compact versions for environments where space is a premium
- ▶ Standard equipment that fits into standard rooms and passes standard doors
- ▶ Heavy duty models that come with a higher safe working load and more clearance for plus sized clients



Other important decision criteria

A mobile floor lifter should allow:

- ▶ an easy and comfortable floor pick up in case of falls
- ▶ an ergonomic handling for the carer and also for the client
- ▶ the client to be easily rotated 360° even in the highest position
- ▶ enough space for the client's head with a proper boom design and a shaped spreader

Mobile floor lifters are designed for a safe and effective transfer of a client. They're not thought as transport devices.

3.2. Ceiling hoist systems ✓

Ceiling hoist systems are physically easier to use than mobile floor lifters. It is not required to move the mobile floor lifter as well as the weight of the client. The track and trolley interface allow the carer to glide the client along the track with minimal effort.

The lifting module (motor unit) is via the trolley connected to a track and overcomes the limited lifting range in mobile lifters. The track is often mounted to the ceiling or the wall, there are also stationary Gantry systems available.

Ceiling track systems require a structural survey to be completed to ensure that the tracking can be safely and securely fitted.



Single track systems take a client to and from fixed points along a single straight, angled or curved track (this can also be mounted on a Gantry system for temporary use).



X-Y systems are where one track is positioned between two other parallel tracks thus allowing for infinite pick up / lowering points within the range of both tracks.

Gantry systems

In instances where a track cannot be installed or if only a temporary solution is needed, a Gantry system can be used. Usually located over a bed, a gantry allows a client to be lifted from bed to chair or wheelchair, with minimal effort.



3.3. Spreader bars

After identifying the most appropriate hoist for the person and environment, some improvements for safer patient handling can be made by selecting a suitable spreader bar. The spreader bars are the stable structure which the sling is hung from. As spreader bars come in various shapes and sizes, there are different benefits.

Spreader bars with loop fixings are most common and are the only type which Invacare manufacture because of the sheer variety of slings that use loop attachments, therefore offering cross compatibility.

Slings are often fixed with several loops on each strap to give you flexibility in positioning when lifting the individual. However, slings and spreader bars which use clip fixings tend to be a little shorter, resulting in the spreader bar having to be brought down lower, often in front of the client's face which can be intrusive. There are also 2-point vs. 4-point spreader bars which have various advantages and disadvantages.

Two Point Spreader Bars

Advantages

- ▶ Quick and easy to apply as the sling straps are close together
- ▶ Can be used for most of the transfer and facilitates a more aggressive sitting position
- ▶ Assists management of spasm or high muscle tone because of closed postural position
- ▶ Reduces risk of hoist related falls because of the closed postural position
- ▶ Useful for smaller clients.

Disadvantages

- ▶ Reduced comfort for some clients, due to closed position
- ▶ Not useful with plus sized clients
- ▶ Closed postural positioning will reduce access when used with slings with apertures



The Invacare **Robin** lifter is unique in the sense that it doesn't feature spreader bars. The advantages of this include:

- ▶ Continuous eye contact can help reassure the client
- ▶ Avoids contact injuries during use
- ▶ Width adapts to the client's size
- ▶ Easier application





Four Point Spreader Bars

Advantages

- ▶ Easy to position taller/bigger clients
- ▶ Easier to attach sling loops when carrying out a floor lift
- ▶ Easier to position to middle of larger bed.

Disadvantages

- ▶ Can exacerbate spasm because of more 'open' postural position
- ▶ Difficult to position in a chair in a 90° angle.

How to select the correct spreader bar size

Measure the client's shoulder width and choose a spreader bar where the distance between the hooks is closest to this measurement.

Clearance risk!

Could the client hit any part of their body on the equipment? Will the selected combination adequately lower/raise the client relative to other equipment being used? For example an inappropriate sling choice may result in the spreader bar being too close to the client's face.

4 Slings for passive transfers

When considering a passive transfer solution, such as a mobile floor lifter or ceiling hoist, the correct selection of sling is paramount in providing a safe, dignified and comfortable transfer. Selecting the correct type of sling depends on:

- Client's body control and need for support (medical condition, functional level, sitting ability)
- Type of transfer — from which position. Sitting to lying or vice versa, sitting to sitting or transfer from floor
- Comfort for the client — consider chronic pain, medical attachments
- The hoist and spreader bar that the sling will be interfaced with

Sling and lifter compatibility

- ▶ **The sling represents the interface between the client and hoist and should be selected with care.**

There are considerations around the use of a manufacturer's slings used with another's manufacturer's hoist. If in doubt, contact the sling manufacturer.

It is considered essential to perform a risk assessment of each moving and handling task, to document in detail.

Consider whether the attachment method on both designs is as the manufacturer intended, are the attachment points of a suitable size, position and shape? Could the sling become inadvertently detached or is the selected method likely to cause undue wear or damage to either hoist attachment or sling? For example a sling with a keyhole clip attachment should only be used with compatible clip spreader bar attachments.



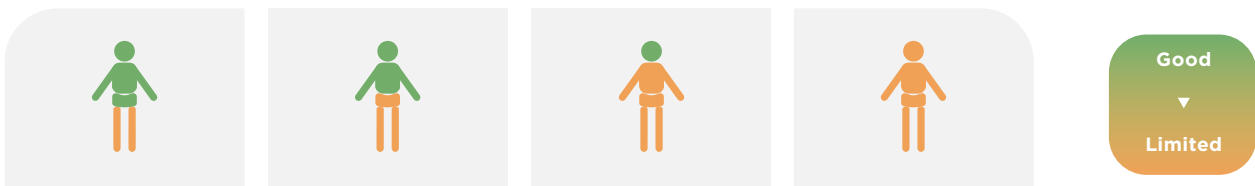
4.1. Selecting the right sling model ▼

Always ensure the sling is specifically designed for the hoist you are using as failing to do so, may cause serious injury. There are different types and sizes of slings available. Selecting the most suitable sling for your client will ensure safety and improve comfort during the transfer. You should consider:

- Client's functional level, size, width and weight
- The type of transfer
- Sling shape matching body control e.g. U-shape or full-body support
- Any preferred position as the result of any medical condition e.g. stroke or amputation
- Material type and any padding
- Any sensitivity to pressure in any area

The main objective of the sling selection is to give the amount of body support that is needed. *Invacare Slings* are designed to give support in those areas where body control and muscle tone are reduced. The main body parts to assess are the legs, hip, trunk and head. The following chart gives an overview of which sling model is suitable depending on the client's physical ability:

Body Control assessment ▼



Body Support provided by *Invacare Slings* model ▼

Very light ▼	Light ▼	Intermediate ▼	Full ▼	Intended Use
	Universal Low	Universal Standard	Universal High	Universal Standard
		Amputee	Universal High Plus	Less optimal*
		Comfort Standard	Easy-Fit	Optimal
		Comfort In Situ	Comfort High	
Dress Toileting Low				
Dress Toileting High				
Light Transfer Support				
Standing Transfer Vest				
Stand Assist				
Transfer Stand Assist				

***Less optimal**
It is important to consider that the client has more remaining capabilities than the sling allows them to use. Thus, they will be immobilised over time. Additionally, more fabric than needed is used, hence it's a bigger effort to apply the sling.

Transfer type ▼

Sitting ↔ Standing Sitting ↔ Sitting	Sitting ↔ Sitting	Sitting ↔ Sitting Lying ↔ Sitting Lying ↔ Lying	Lying ↔ Sitting Lying ↔ Lying
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4.2. Sling shapes

► Slings with divided legs

The sling is easier to place and remove because of the divided leg support. The user can participate during sling application and removal. Depending on transfer task and the risk of sliding out, the Invacare Slings offer three different opening widths.

Regular opening

For universal transfer purposes.
Invacare Universal Sling family:

- Universal Low
- Universal High
- Universal Standard
- Universal High Plus

Small opening

For users with atrophy in their gluteal muscles. The leg supports can be safely placed in hammock position.
Invacare slings:

- Easy-Fit
- Amputee

Wide opening

Mainly for hygiene purposes with a very good access to the client. With less fabric than other models, it's very easy to apply and remove - especially when sitting in a wheelchair.
Invacare slings:

- Dress Toileting Low
- Dress Toileting High

► Undivided legs

A sling for users that need more support.
The lower part of the sling should be placed 10 cm behind the hollow of the knee.

Invacare Comfort Slings:

- Comfort Standard
- Comfort High
- Comfort In Situ

► Vest for standing and walking training

A sling that gives users a more active and independent transfer with safe support.

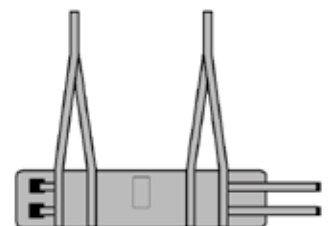
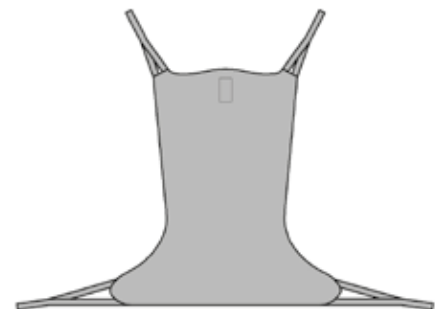
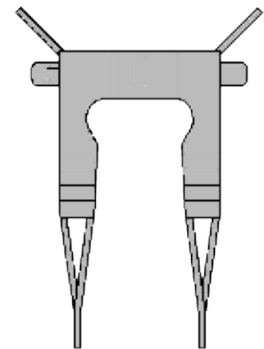
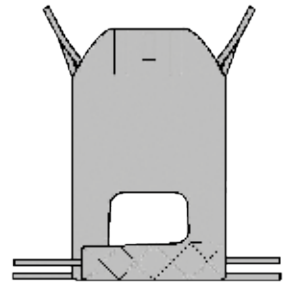
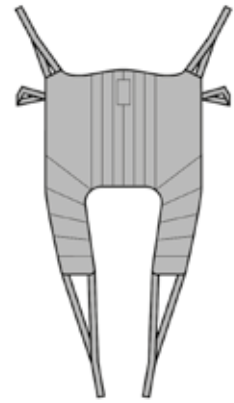
Can be used as a training tool e.g. standing or balance training.

- Standing Transfer Vest

► Light Transfer Support

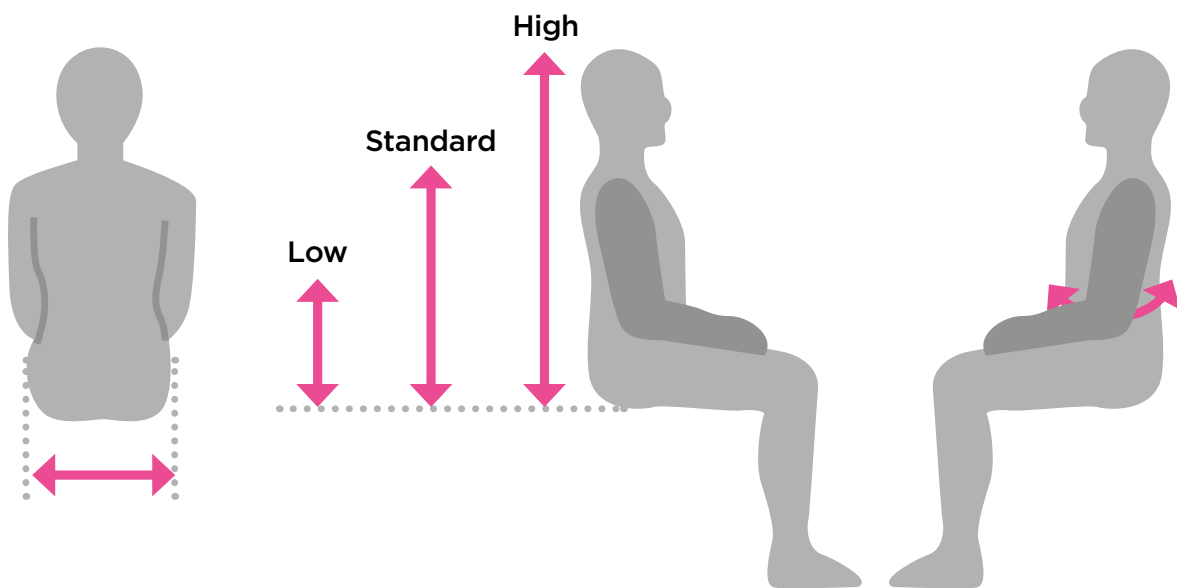
Sling for supporting, repositioning and/or lifting a part of a body.

- Light Transfer Support



4.3. Selecting the right size ▼

► To select the correct sling size, the most important measurements are hip width and back height in the sitting position. For slings with belts, the waist circumference is important, too.



Invacare Slings sizes and safe working load

► Size	XS	S	M	L	XL	XXL
► Safe Working Load	200 kg	200 kg	200 kg	200 kg	250 kg	300 kg

The client's weight needs to be considered mainly for the sling's maximum safe working load. It's inferior to indicate the right sling size.

If no head support is needed, the correct back height is from the lower back until the shoulder/neck. With the need of head support the measurement needs to include the head, too.

► If the sling is too big, the client may slip out. If the sling is too small, the client may still slip out, particularly with less body control. It could also exasperate the client's medical condition. When selecting a size, if your client is in-between sizes, having a slightly smaller sling, could keep your client more secure.

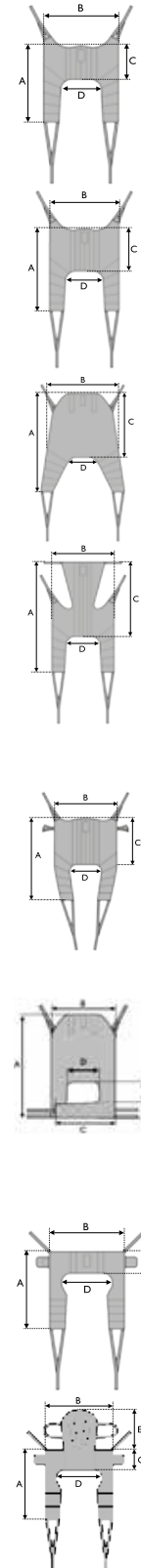
Some medical conditions such as stroke, orthopedic conditions, amputations or certain wounds may affect sling choice.

Measurements

► One of the most important factors to perform a safe transfer is the match between hip/trochanter width and the measurement of the sling's opening between the leg support. If between sizes the smaller size may keep the client more secure.

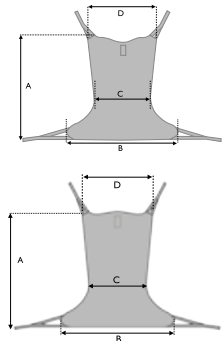
Invacare Slings with divided legs

Universal family with regular opening		XS	S	M	L	XL	XXL
Universal Low	A	820	850	920	950	970	
	B	700	800	935	1075	1140	
	C	280	350	375	405	405	
	D	365	410	480	575	730	
Universal Standard	A	965	1000	1085	1180	1240	
	B	800	915	1050	1095	1240	
	C	405	510	560	585	590	
	D	365	410	480	555	720	
Universal High	A	1040	1080	1425	1555	1600	1650
	B	740	845	1000	1120	1190	1285
	C	615	770	900	1000	1000	1000
	D	310	350	375	450	570	600
Universal High Plus	A	1335	1385	1510	1580	1590	
	B	500	570	660	740	850	
	C	705	880	935	970	970	
	D	305	345	455	565	630	
Small opening		XS	S	M	L	XL	
Amputee	A	1060	1100	1160	1360	1510	
	B	815	930	970	1230	1360	
	C	390	490	520	570	600	
	D	285	320	355	410	500	
Easy-Fit	A	1105	1130	1200	1270	1360	
	B	710	760	800	860	950	
	C	590	630	675	720	760	
	D	150	185	235	245	255	
	E	170	180	190	210	210	
	F	120	150	195	215	225	
Wide opening		XS	S	M	L	XL	
Dress Toileting Low	A	840	870	950	1020	1100	
	B	620	710	800	900	1080	
	C	160	200	230	230	270	
	D	380	430	495	600	760	
Dress Toileting High	E	400	400	465	465	465	



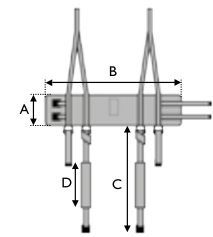
Invacare Slings with undivided legs for full body support

Comfort Family		XS	S	M	L	XL	XXL
Comfort Standard & Comfort in Situ	A	870	960	1020	1160	1170	1200
	B	970	1050	1170	1290	1330	1395
	C	505	550	610	675	745	820
	D	940	1000	1050	1110	1275	1340
Comfort High	A	1040	1150	1395	1445	1460	
	B	970	1050	1170	1290	1330	
	C	510	550	610	675	745	
	D	960	1020	1160	1280	1470	



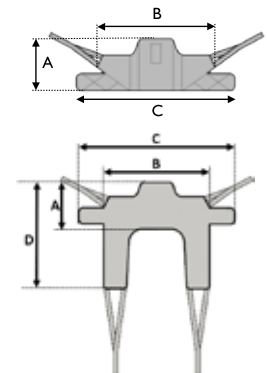
Vest for Standing and Walking Training

		XS	S	M	L	XL
Standing Transfer Vest	A	150	150	180	180	180
	B	750	850	950	1050	1200
Groin Band	C	-	850	-	950	-
	D	-	850	-	350	-



Invacare Slings for stand assist lifters

		XS	S	M	L	XL
Stand Assist	A	260	260	330	360	360
	B	840	840	895	950	1020
	C	900	950	1170	1270	1810
Transfer Stand Assist	D	-	965	1060	1160	1260
Same dimensions as Stand Assist plus "D"						



► Size	XS	S	M	L	XL	XXL
► Safe Working Load (kg)	200 kg	200 kg	200 kg	200 kg	250 kg	300 kg

4.4. Fabrics



Polyester - Solid

- ▶ A strong material that is hard-wearing and easy to apply. It slides smoothly into place and dries quickly after washing. This comes as standard on all models.



Polyester - Net

- ▶ Also known as mesh fabric, the net option is ideally suited for bathing or showering environments. It has quick drainage and drying properties.



Spacer

- ▶ The breathable spacer fabric is two-way stretch allowing the material to adapt to the contours of the user, resulting in high levels of comfort and support.



Certified flame-retardant material

- ▶ Available for the Comfort In Situ sling in Spacer fabric
- ▶ Environmentally friendly
- ▶ Third-party tested against EN 1021:2014 parts 1 and 2



4.5. Choosing the right loops ✓

It will be necessary to trial several different loop positions onto the spreader bar before the most comfortable and posturally appropriate position is identified. Once identified, it is advisable to mark the loops with loop markers to ensure that all carers use them correctly. It should be noted that a client with a changing condition may well need this modifying, depending on how they are presenting at any given time.



For example, if there is an increase in spasm it may be necessary to shorten the leg support a little, relative to the shoulder support, in order to lift the client in a position that reduces hip flexion, thus reducing the effect of that spasm.

A risk assessment with written instructions should be left with client and carer denoting which loops to use.

Informed equipment choices

- ▶ All assessment and equipment selection needs to incorporate balanced decisions.

Elements include client need, the needs of the organisation providing the equipment as well as the needs and capability of the person that will operate the equipment. It may be necessary to make compromises but these compromises should never threaten the health and safety of the client or the carer.

For guidance only

This document provides general opinions and advice. However it does not deal with specific individuals or situations. A practitioner should always seek appropriate and specific advice from a suitably qualified professional before attempting to use methods outlined in the above.

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