

# Getting the right fit: made-to-measure garments for lymphoedema management

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Lymphoedema is classified as a chronic progressive condition, which if left untreated can lead to loss of physical function and decreased quality of life (Lymphoedema Framework, 2006). There are many different causes of lymphoedema, which can be ascertained by thorough assessment by the health professional and can be considered to be primary or secondary in nature. Lymphoedema can occur when the transport capacity of the lymphatic system is reduced, as in the case of some primary lymphoedema, and the load remains the same (Pallotta et al, 2011). The condition results in a formation of fluid within the tissue space, which can cause skin changes, due to increase in protein, leading to episodes of infection and reduced function (Lymphoedema Framework, 2006).

Compression can be seen as the single most important element of treatment both initially, during the decongestive phase and for long-term maintenance of oedema (International Lymphoedema Framework, 2012). The earlier the intervention with compression garments the better the outcome for patients, as the need for compression bandaging is reduced (Linnitt, 2012). This can present a challenge for clinicians due to the different garments available on drug tariff, highlighting the importance of clinicians having an increased knowledge in an attempt to

minimise the implementation of compression bandaging and the resources used (Lee and Wigg, 2012). In contrast, compression garments are often used in conjunction with other treatments such as manual lymphatic drainage (MLD), skin care and exercise to help reduce and maintain limb volume (Lymphoedema Framework, 2006).

## Compression garments: how they work

The aim of wearing compression garments is to limit the formation of oedema within the tissue space by providing graduated compression, encouraging it to the root of the limb (Wigg, 2012). This is achieved through the garment altering interstitial pressure, improving lymphatic drainage by the stimulation of lymphatic contraction and can result in a breakdown of fibrosclerotic tissue (Carati et al, 2010).

According to Doherty (2006), the use of compression garments aims to form a semi rigid casing to limbs while producing high working pressures and low resting pressures, similar to those achieved from compression bandaging or Velcro wrap systems. However, this is not always achieved when using circular knit garments due to the elastic content of garments, highlighting that flat knit garments may be more appropriate in achieving greater stiffness.

Compression garments can be constructed in two ways. Circular knit hosiery is knitted continuously on a cylinder to produce a seamless, thinner, more aesthetically pleasing garment. The technique uses less yarn than that used in flat knit construction and will have a higher level of elasticity (Linnitt, 2012), which may cut into limbs, resulting in pain and skin damage if used on limbs with severe shape distortion (Rostron, 2011). Often patients who are provided with a circular knit garment will complain of tightness at the knee or friction to the ankle fold. Due to the elasticity of the circular knit garments, if not selected correctly or fitted appropriately, the garments can provide a higher resting pressure causing some discomfort. It should be remembered that circular knit garments can be suitable for the majority of patients who will not experience problems.

Flat knit garments are less elastic than those made using a circular knitting technique as they are knitted flat on

## ABSTRACT

The purpose of this article is to discuss the use of custom made compression garments in the management of lymphoedema and chronic oedema. Patients often present to therapists with inappropriate, ill-fitting garments that can contribute to an increase in oedema and poor limb shape. Patients frequently report garments as being uncomfortable and therefore intolerable leading to a lack of concordance with wearing garments. The selection and fitting of the correct garment can affect outcomes and the patients' quality of life. The focus of this article is to increase the health professionals' knowledge and skills in the selection, measurement and fitting of custom made garments to ensure correct fit and increased concordance when compression garments are prescribed.

## KEY WORDS

Chronic oedema ♦ lymphoedema ♦ flat knit compression garments ♦ static stiffness

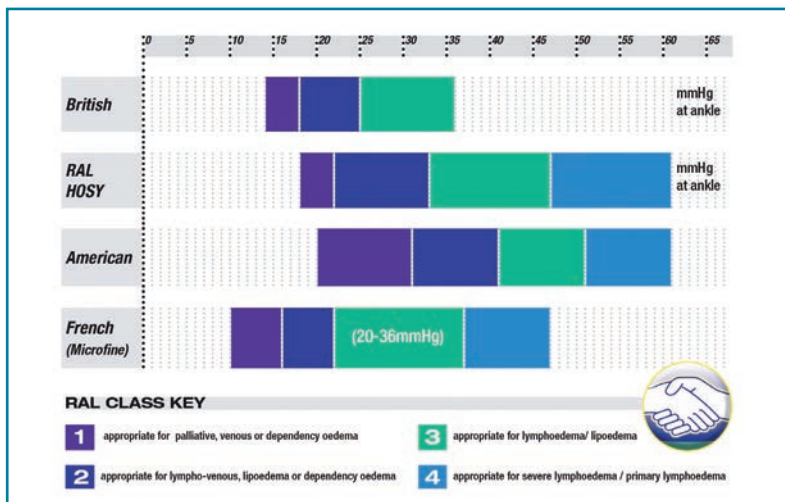


Figure 1. Reichsausschuss Fur Lieferbedingungen (RAL) classification

a machine, using more threads providing a stiffer fabric finish. The edges are then sewn together to complete the garment with a seam along its length. Due to their increased stiffness, they sit on the tissues providing a lower resting pressure and tend to be more comfortable. If the tissues are more pitting they can sit on the limb without constriction and are tolerated better by most patients. Although not as cosmetically pleasing, their performance and comfort are reported as better than a circular knit. Selection of the correct patient and condition is paramount to ensure compliance and performance and sometimes the need for a higher class circular knit garment can be reduced by using a stiffer, flat knit garment of a

Figure 2. Where patients do not have dexterity to be able to use a zip there are options for a Velcro strip as an alternative or Velcro straps, which sit horizontally at set points throughout the garment



lower compression.

Compression garments from Haddenham Healthcare are standardised using the Reichsausschuss Fur Lieferbedingungen (RAL) classification, which is the organisation responsible for quality and technical standards in Germany (Figure 1). When considering which products to use this should be taken into consideration as not all companies provide compression according to RAL, for example a garment that is class 1 British Standard will provide less compression at the ankle than those of RAL standard (Lee and Wigg, 2012). In contrast when using compression garments the stiffness factor should also be considered, which can make the garment perform similar to that of short stretch bandages by being very effective in improving lymphatic function and reducing oedema (Williams, 2002). The stiffness of fabric refers to its ability to withstand any change in limb shape when the limb moves and can be classified by using the static stiffness index (SSI). The SSI shows the difference in pressure of a garment or bandage when the patient is resting and standing, if the pressure is 10mmHg or more the garment is classified as having a high SSI (Partsch and Junger, 2006). It is important for the clinician to understand the importance of graduation of compression, as garments provide a reduced graduation from toe to thigh. The ability to be able to have a reduced compression gradient can assist in the reduction of full leg oedema. This is so that a higher level of compression can be achieved throughout the whole leg to support the lymphatics more effectively and provides a reduced graduated profile than with other garments.

### Problem-solving compression therapy

Haddenham Healthcare made to measure products have two choices of flat knit garment fabrics available on drug tariff with a variety of strength options classes 1-4.

Pertex 1 is a soft, gentle and conforming fabric which is suited to those patients with sensitive or fragile skin, in palliative care, or those with a dependency or lymphovenous oedema. It can be an ideal solution for elderly patients with weak hand strength, as its unique stretch characteristic allows for easier donning. Pertex also has a larger loop structure which allows more air permeability and therefore minimal skin reactions occur because heat does not build up under the garments. Haddenham Pertex RAL classes 2 and 3 replace the fabric formerly known as Doktus and is soft but firmer for more moderate oedema. Goldpunkt RAL class 2, 3 and 4 is a more robust fabric offering greater stiffness of fabric to control more severe, stubborn oedema which may be fibrosed or have skin changes and be either primary or secondary in nature or a long-standing arm oedema. Anecdotal evidence from practice suggests the silky feel of the Goldpunkt fabric improves patient comfort. Each garment is available in below-knee, thigh-length and panty options with variations to include

thigh-high with waist attachments and one-legged panty.

With the introduction of the Haddenham Healthcare flat knit range onto drug tariff clinicians have a range of problem-solving solutions available to aid patients with concordance where comfort and application of garments are problematic. All lower limb flat knit garments can be requested with a zip sewn into the fabric, which can assist with application and is a useful addition if a wound dressing needs to be in place. Where patients do not have dexterity to be able to use a zip there are options for a Velcro strip as an alternative or Velcro straps which sit horizontally at set points throughout the garment (Figure 2). Compression hosiery can be used in all clinical stages of lower limb lymphoedema enhancing self-care (Doherty et al, 2009). Velcro straps may prove useful and aid self-management where patients are unable to apply compression garments effectively thus enhancing patient independence and saving resources within the community nursing team. Where low exuding wounds are present, dressings can be applied under garments with tabs or zips, without being disturbed by the donning and doffing of hosiery. The pertex range is particularly effective where skin is fragile or skin conditions such as varicose eczema are present.

If upper limb oedema is present, where the tissues can be fatter to the upper portion of the arm, often a flat knit garment will not roll at the top and sit comfortably. This is also the case where patients may have a pitting oedema to knee level and circular knit garments have rolled or dug in. As a flat knit garment does not have a top band, if measured correctly, these sit comfortably to the knee level.

Haddenham Healthcare has made ordering custom made garments straight forward, due to a new simple system of drug tariff codes. Clinicians use one or two codes per garment, as options such as closed toe and colour are included as standard, at no extra cost, saving the need for the use of several codes per garment. This is the same for the unique 'Y' heel, which is included as standard in all Haddenham Healthcare lower limb garments to ensure an even distribution of fabric across the top of the ankle; ensuring garments are more comfortable (Figure 3). When measuring for Haddenham garments it is particularly important to follow the instructions and complete all sections on the measurement form (Figure 4). The simplicity of the measurement form ensures that clinicians are able to understand clearly what measurements are required for each garment. All measurements should be taken with the patient sitting or lying, up to 'F' and standing for thigh-length and panty options. It is essential that all length measurement points are marked on the patient with a skin marker prior to taking measurement for circumferences.

Length measurements should be taken straight unless there are extensive shape changes to the limb that would require measurement to follow the contour of the leg. When measuring the circumferences at 'H' it is important



Figure 3. The 'Y' heel ensures even distribution of fabric across the top of the ankle for added comfort

**CUSTOM GARMENTS FP10 / GP10 ORDER FORM** fp10@hadhealth.com Form Downloadable: www.hadhealth.com FO033

**HADDENHAM** Patient Name: \_\_\_\_\_ Order No. \_\_\_\_\_ Pharmacy Delivery Address: \_\_\_\_\_  
 Date Measured: \_\_\_\_\_ Repeat Garment No. \_\_\_\_\_  
 Measured by: \_\_\_\_\_ Telephone: \_\_\_\_\_  
 Clinic / Hospital: \_\_\_\_\_ E-mail: \_\_\_\_\_ PostCode: \_\_\_\_\_  
 FAX: 01844 208843

**1 LENGTH MEASUREMENTS**  
 FRONT "PANTY SHAPING" BACK  
 Side: \_\_\_\_\_ cm  
 Public bone to I: \_\_\_\_\_ cm Global fold to I: \_\_\_\_\_ cm  
 g-I: \_\_\_\_\_ cm (Take measurement at side)  
 J-H: \_\_\_\_\_ cm (Take measurement at side)  
\*Only measured when selecting pantyhose

**2 CIRCUMFERENCE MEASUREMENTS & STYLE**  
 BELOW KNEE THIGH HIGH THIGH HIGH PANTYHOSE  
 RIGHT SIDE LEFT SIDE  
 WART I (only for Panty)  
 HIGHEST POINT OF BUTTOCK I (only for Panty)  
 RIGHT g LEFT g  
 f f  
 e e  
 d d  
 c c  
 b b  
 A A  
 B B  
 RIGHT h LEFT h

**3 TOE CHOICE (no charge)** OPEN TOE OPTION  
 CLOSED TOE  OPEN TOE  SLANT CUT FOOT  Start cut inside foot \_\_\_\_\_ cm  
 Start cut outside foot \_\_\_\_\_ cm

**4 SELECT FABRIC & COMPRESSION CLASS**  
 FLAT KNIT  
 Pertex Class 1 18-21 monthly   
 Pertex Class 2 23-32 monthly   
 Pertex Class 3 34-46 monthly   
 Goldpunkt Class 2 23-32 monthly   
 Goldpunkt Class 3 34-46 monthly   
 Goldpunkt Class 4 49-70 monthly   
 SELECT COLOUR (no charge)  
 BEIGE  BLACK  LIGHT BEIGE   
\*Please show position and/or dimensions on diagram and/or garment tag before  
 QUANTITY REQUIRED  
 RIGHT \_\_\_\_\_ LEFT \_\_\_\_\_ PANTYHOSE \_\_\_\_\_

**5 SPECIAL STYLE OPTIONS**  
 THIGH WITH WAIST BAND ATTACHMENT: Fastening: Velcro  Adjustable Button   
 Length G to waist (take measurement at side) \_\_\_\_\_ cm  
 ONE LEG: Right  Left

**6 CHARGE OPTIONS**  
 GRIP TOP OPTIONS: 3cm plain Grip Top  3cm strong plain Grip Top  5cm fine lace Grip Top  5cm strong lace Grip Top   
 2 MALLEOLUS PADS\* Left  Right   
 FASTENING OPTIONS\* Zip  Velcro Fastening  Velcro Straps  City   
 SPECIAL OPTIONS (no charge)  
 PANTY OPTIONS: Full Compression  Other Compression\*   
 Fly opening  Open Crotch (no gusset)  Maturity: Loose Fit  Open Front   
 LEG OPTIONS: Full Compression  Higher Compression above \_\_\_\_\_  Reduced Compression above \_\_\_\_\_   
\* Please specify in comments box below

**7 COMMENTS / REQUESTS**

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Figure 4. Haddenham Healthcare measurement form. It is important to follow the instructions and complete all sections on the form

to ensure that the patient has their foot semi flexed as this will prevent the measurement being too tight at this point. This is also the case at the 'E' measurement where the knee should be slightly bent to prevent the garment rubbing at the popliteal crease. Consideration should also take place regarding the patients' activity level or lifestyle to ensure a comfortable fit. For example, if the patient spends more time with the knee flexed then the circumference taken in that position maybe more appropriate.

Full instructions for made-to-measure garments are available on the Haddenham Healthcare website (www.





**Figure 5.** Mrs D was referred to the lymphoedema clinic following several years of compression bandaging to treat her long-standing lymphovenous oedema



**Figure 6.** Following discussion and measurement it was agreed, that Mrs D would be fitted with a made to measure pertex light garment, class 1

hadhealth.com), however, this does not replace formal training in the measuring and fitting of made-to-measure garments; made-to-measure courses are available.

### Case study 1

Mrs D was referred to the lymphoedema clinic following several years of compression bandaging to treat her long-standing lymphovenous oedema (Figure 5). Each time Mrs D was prescribed garments by the community staff she would find that her oedema and skin condition deteriorated. On assessment, and following in-depth consultation regarding her previous treatment, Mrs D confided that she had always found she could not tolerate the hosiery that had been prescribed as it was difficult to apply and would ‘bite’ at her ankles.

Mrs D had previously been prescribed circular knit compression that was not suitable for her skin condition or limb shape. Although Mrs D did not have any skin folds her skin was very delicate and became irritated by garments. She also suffered from osteoarthritis and found the garments constricted behind her knees.

Following discussion and measurement, it was agreed that she would be fitted with a made-to-measure pertex light garment, class 1, thigh length with closed toe and a grip top options (Figure 6). This was due to the gentle fabric provided by the pertex and its slight stretch which would aid the ease of donning. Pertex 1 has the benefit of being made of elastodiene and polyamide which allows for more stretch than other, stronger fabrics, such as Goldpunkt.

The risk of skin irritation was reduced by the garment having no latex content. Being a flat knit fabric there was also a reduced risk of the garment causing discomfort at the ankles but still maintaining the required level of compression. Mrs D found her new garments very comfortable and was able to manage application and tolerate wearing them every day, subsequently her oedema reduced and mobility and quality of life improved considerably.

### Case study 2

Mrs S, is a 38-year-old lady who has spina bifida. She had suffered from bilateral oedema all of her life which had increased with age as her mobility had reduced. She had undergone several courses of multi-layer bandaging and MLD but had always rebounded following treatment due to the dependency element of her legs. As seen in Figure 7 and Figure 8, the shape of Mrs S’s leg was a challenge for garments to fit and although preferring circular knit garments, these had never been comfortable for her.

The selection of a pertex 2 flat knit garment meant that Mrs S could tolerate the level of compression required for her individual condition and the fit was comfortable and accommodated the shape of her feet well. The flat knit garment ensured that when she was carrying out passive exercises, that there was a good venous and lymphatic return reducing the oedema. The selection of the correct



**Figure 7.** Mrs S, is a 38 year old lady who had spina bifida. She had suffered from bilateral oedema all of her life which had increased with age as her mobility had reduced



**Figure 8.** The shape of Mrs S's leg was a challenge for garments to fit and although preferring circular knit garments, these had never been comfortable for her

flat knit compression prevented any refill back into the limbs.

### Conclusion

When selecting garments, it is essential that consideration is given regarding the cause of the oedema, the patients specific past medical history and lifestyle. Equally important is the knowledge of the therapist in measuring for the correct garment. Now that Haddenham custom-made garments are available on drug tariff, this has increased the choice and availability of specialist garments for measurement and selection by the therapist. In turn, increasing the possibility of patient concordance by improving fit and special options such as Velcro tabs aiding patient application.

The selection of a flat knit garment, providing a higher working and low resting pressure can sometimes eradicate the need for bandaging and allows for fitting to slightly more challenging limb shapes or varied conditions. The selection of the appropriate fabric and class for the individual condition will ensure that improved compliance can be achieved for patients. Ultimately, this will improve patients' quality of life and attitude to their condition.

**BJCN**

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Carati C, Gannon B, Piller N (2010) Anatomy and physiology in relation to compression of the upper limb and thorax. *Journal of Lymphoedema* 5(1): 58-67

Doherty D (2006) Treating lower limb lymphoedema with compression bandaging. *Wound Essentials* 1: 16-70

Doherty D, Morgan P, Moffatt C (2009) Hosiery in lower limb lymphoedema. *Journal of Lymphoedema* 4(1): 30-7

International Lymphoedema Framework (2012) *Best practice for the management of lymphoedema. 2nd Ed. Compression therapy: a position document on compression bandaging.* Imprimerie Reboul, France

Lymphoedema Framework (2006) *Best practice for the management of lymphoedema.* MEP, London.

Linnitt N (2012) Indications for deciding compression in the treatment of chronic oedema. *Br J Community Nurs* 17(4):S11-5

Lee N, Wigg J (2012) Selecting compression garments for treating chronic oedema. *Br J Community Nurs* 17(10): S26-31

Partsch H, Junger M (2006) Evidence for the use of compression hosiery in lymphoedema. In: *Lymphoedema Framework. Template for practice: compression hosiery in lymphoedema.* MEP Ltd, London

Pallotta O, McEwen M, Tilley S, et al (2011) A new way to assess superficial changes to limb oedema. *Journal of Lymphoedema* 6(2): 34-41

Rostron A (2011) Jobst Opaque and Bellavar Ready to wear hosiery range. *Journal of Lymphoedema* 6(1): 72-6

Wigg J (2012) Supervised self-management of lower limb swelling using FarrowWrap. *Br J Community Nurs* 17(4): S22-9

Williams AF, Vadgama A, Franks PJ, Mortimer PS (2002) A randomised controlled crossover study of manual lymphatic drainage therapy in women with breast cancer-related lymphoedema. *Eur J Cancer Care (Engl)* 11(4): 254-61

### LEARNING POINTS

- ◆ Compression garments are the single most important part of treating chronic oedema
- ◆ Flat knit, custom-made garments are indicated where there is poor shape or pitting oedema
- ◆ Consider the patient, type of oedema and activity level when measuring for garments
- ◆ Garments should be fitted as soon as possible to prevent complications and to save on resources in the future