

THE MICROFINE GLOVE AND ITS USE IN THE MANAGEMENT OF HAND OEDEMA

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A recent study has shown that in the UK, 90% of people with lymphoedema wear some form of compression garment (Lam et al, 2006). The use of compression is a recognised cornerstone of lymphoedema management as defined by the British Lymphology Society (BLS) (1997). All compression garments have an elastic element to them, which is essential to enable limb movement when the garment is worn and to facilitate application (Doherty, 2006). However, the garment must also be rigid enough to deliver effective compression.

The use of compression garments has been shown to limit capillary filtration and provide external resistance to the muscle pump activity during exercise (Mortimer, 1995). To achieve this, compression garments aim to provide a semi-rigid casing to the limb, so producing a high working and low resting pressure — although this is limited by the necessity of elasticity in the garments (Doherty, 2006). The main aim of compression therapy is to reduce swelling, improve joint mobility and reduce discomfort (Anderson et al, 2000). It is important that the practitioner selects an appropriate garment: one that applies enough compression to be effective without restricting movement and affecting the comfort of the patient, and thus their compliance with treatment.

This is particularly true for certain parts of the body, such as the hands, which remain difficult for the therapist to measure and fit, and where it can prove difficult for the patient to tolerate the use of a compression garment (Todd, 2000). However, it is vital that the compression garment fits perfectly for it to be effective and to encourage compliance with treatment. In such anatomical positions, these requirements are difficult to meet when using off-the-shelf products. This means that the patient with hand oedema will often need to be measured for an individually tailored custom-made garment.

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The effect of hand oedema on the patient

The presence of hand oedema can often result in both physical and psychological difficulties for the patient. It can affect grip and dexterity, and in some instances the patient may also report altered sensation in the fingers and hand as a direct result of the pressure from the oedema on the nerve endings. If the lymphoedematous hand is also the dominant hand, this can lead to

reduced independence and have a significant impact on the patient's quality of life.

As well as the physical effects of hand oedema, body image should be considered. Patients with lymphoedema sometimes find that the lymphoedematous limb becomes the main focus in their life and often dominates daily activities (Mirolo et al, 1995; Curtis, 2006).

Treating oedema of the hand

The treatment of hand oedema follows the cornerstones of lymphoedema care, often involving an intensive phase of treatment incorporating the use of multilayer lymphoedema bandaging (MLLB) to reduce swelling, followed by maintenance using compression garments.

There are a wide range of compression gloves available to the lymphoedema specialist, although the majority of them have been manufactured using traditional flat-knit technology, resulting in a rigid and thick feel. There is limited evidence supporting the use of compression gloves but their effectiveness is widely recognised, as is the difficulty associated with wearing them. Generally, the use of compression gloves can further decrease the grip and dexterity the patient has, as well as becoming a visible reminder of the oedema and past treatment. Compression gloves for hand oedema are currently available as off-the-shelf or custom-made garments.

When produced as an off-the-shelf garment, the finger lengths are predefined at production level,

according to the size of the glove ordered. The predefined finger length leaves the fingertips free of compression to enhance comfort and function. If the finger stub of the glove extends too far up the finger, it can lead to a loss of function so affecting work and home life (Todd, 2000). Conversely, if the finger stub is not long enough, it can cause oedema to pool in the distal end of the fingers. Due to the nature of the flat-knit material, it is impossible to adjust the length of the finger stub on the off-the-shelf product without damaging the compression delivered. If cut, the material will fray and roll, making the garment ineffective. As a result, the only way to tailor the finger stub length to the wearer's needs is by ordering a custom-made garment. This has the associated complications of higher cost, measuring expertise and time of production of the garment.

Custom-made compression garments, although having the advantage of an individually measured fit, require specialist time for measurement and fitting, take more time to manufacture and cost more than off-the-shelf products. The other major consideration is the actual measurements required and the skill of the specialist in taking them. Obviously, without accurate measurements, the finished garment will not fit the patient correctly.

In addition to the physical restrictions imposed by wearing a rigid glove, there are also psychological elements to consider. A compression garment worn on the hands is noticeable, and how it looks often becomes a major factor. The visual impact of the compression glove can lead to difficulties of acceptance and the manifestation of body image issues (Woods, 2000). Body image is based not just on how we perceive ourselves but also, in part, on the reactions of others towards us (Price, 1990).

From these principles and theories it is possible to see the link between

British standard			French standard	RAL standard		
14-17 mmHg	18-24 mmHg	25-35 mmHg	20-36mmHg	18-21 mmHg	25-32 mmHg	35-46 mmHg

Figure 1. Relationship between the British standard BS 6612:1985, French standard ASQUAL and German standard RAL-GZ 387:2000.

compression garments and changes in body image, and to possibly understand the link between body image and non-compliance with garments.

Microfine glove

The glove is manufactured using technology which enables the fingers to be cut without compromising the compression delivered. The Microfine glove is available in beige or black and can be worn on either hand. It is available either as an off-the-shelf or custom-made garment.

Regardless of the method of manufacture, all compression garments have to adhere to certain standards and are classified into compression classes. The mmHg rating of the compression classes varies depending on the standard the garment is manufactured to. The relationship between the British standard BS 6612:1985, French standard ASQUAL and German standard RAL-GZ 387:2000 is shown in Figure 1. These are the three standards commonly used in the UK market: the RAL standard being predominantly used when treating lymphoedema.

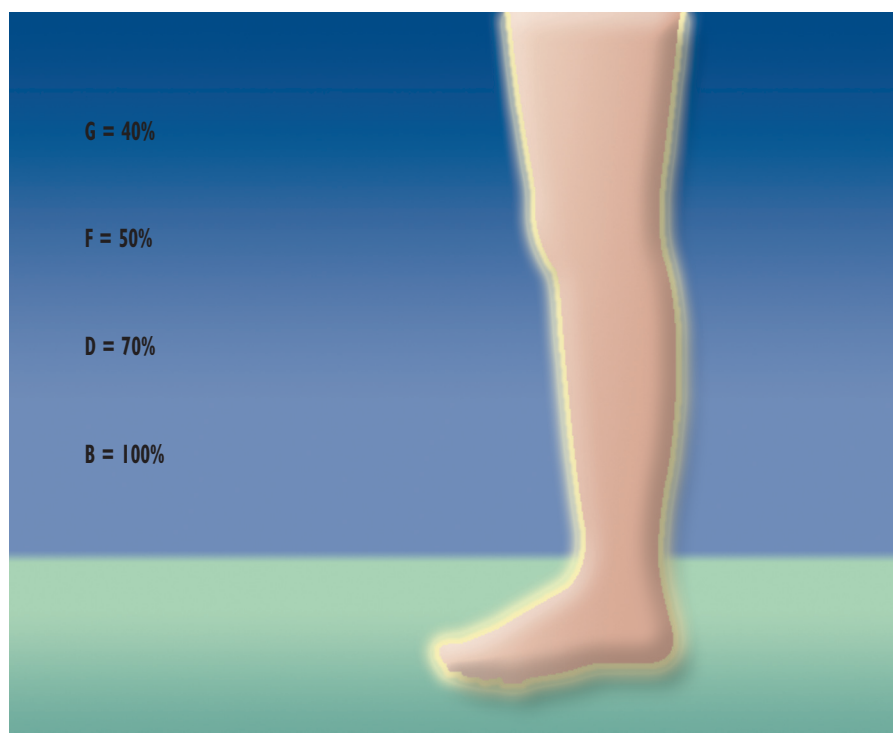


Figure 2. Graduated compression profile of a stocking.

The Microfine glove is produced to the French compression standard, the fit with the RAL standard can clearly be seen in *Figure 1*.

All these standards follow the principle of graduated compression along the length of the limb from the distal to proximal end, as shown in *Figure 2*. When choosing compression garments it is important to consider the principles of Laplace's Law and adapt compression classes accordingly (Morison and Moffatt, 1995).

The benefits of Microfine technology

The technology used in the manufacture of the Microfine glove produces an extremely fine and conforming flat-knit compression glove, compared to the traditional flat-knit compression glove. The finer feel of the fabric can lead to maintenance in the level of dexterity the patient has, as the material is less bulky over the fingers and conforms well on movement. In turn, this can reduce the functional impairment seen with thicker, more rigid gloves. The level of compression is not compromised by the fineness of the fabric.

The Microfine glove is also ambidextrous, so removing the need to stock right- and left-handed garments. The finger stubs on the glove have purposefully been designed to be long (*Figure 3*) and can be cut to meet individual patient requirements (*Figure 4*). The compression offered remains the same, as the garment will not fray or roll where it has been cut. The seams also do not run when cut, unlike other compression garments.

The Microfine glove allows the lymphoedema specialist to individually customise an off-the-shelf compression garment, thus eliminating the need for measuring in cases where finger length is the main concern. This has a cost benefit to the specialist as well as a time-saving advantage for both the specialist and the patient.

The size selector is highlighted in *Figure 5* and is available from Haddenham Healthcare. The



Figure 3. Microfine glove — the finger stubs have purposefully been designed to be long.



Figure 4. Microfine glove — the finger stubs can be cut to meet individual patient requirements.

Haddenham ad

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Measurement points	Xsmall-1	Small-2	Medium-3	Large-4
Palm at base of fingers	Below 18cm	18–20cm	20–22cm	Over 22cm
Palm at fold of the thumb	Below 19cm	19–21cm	21–23cm	Over 24cm
Wrist	Below 18cm	18–20cm	20–22cm	Over 22cm

Figure 5. Size selector for off-the-shelf Microfine gloves.

Microfine glove costs £33.00 for an off-the-shelf garment and £59.00 as a custom-made glove for those patients who have special requirements, i.e. longer cuff or closed fingers, or the few patients who do not fit in the standard size garment.

Evidence to support the use of the Microfine glove

While compression garments are an accepted and widely-used element of lymphoedema treatment, there is little evidence to support this (Partsch and Jünger, 2006). The majority of research covers the use of compression to treat venous disease, not lymphoedema. Of the research that is available to support the use of compression in patients with lymphoedema, very little discusses arm lymphoedema and even less mentions hand oedema as a condition in its own right.

Within the lymphoedema market, the Microfine glove is a relatively new arrival. It was first launched in June 2005, so evidence to support its use is lacking. However, a recent small audit has been conducted. The study group was made up of 26 females who had developed hand oedema following surgery for breast cancer. An independent audit was carried out by a skilled lymphoedema therapist to aid her decision-making with compression garments. The audit was both subjective, with the patients completing a questionnaire, and objective, by manual assessment by the therapist. All the patients who took part had previously worn traditional flat-knit gloves. The Microfine gloves were tailored and adapted by the therapist for the individual patients. The issue of the

Microfine glove working well with soft pitting oedema came from the study.

The audit took place over a six-month period and focused on:

- ▶▶ Comfort (assessed subjectively by the questionnaire)
- ▶▶ Effectiveness (assessed objectively by manual assessment via the questionnaire)
- ▶▶ Preference for adaptability and microfine versus flat-knit garment
- ▶▶ The length of time that the glove was worn in a 24-hour period and the activity undertaken while wearing the glove.

The audit found that 73% of patients using the Microfine glove found it both comfortable and effective in reducing their hand oedema. The conclusion drawn from both the objective and subjective measurements was that the Microfine glove was ideal for mild to moderate oedemas, and that traditional flat-knit gloves were ideal for severe oedema. Mild to moderate oedema does not mean it resolves overnight — true lymphoedemas do not resolve overnight — but that it does not have the wooden fibrotic feel that can be associated with severe oedemas. A larger study is required to fully support the use of the Microfine glove in treating hand oedema, but the current anecdotal evidence from therapists and patients is positive.

Conclusions

Hand oedema can be problematic to treat, and compression garments can be difficult to measure for and fit. It is important, however, for the patient to have an acceptable treatment option, since hand oedema can lead to loss of function which can impact significantly

on activities of daily living (ADL), and the visibility of the garment can exacerbate body image issues. The Microfine glove is an adaptable, ready-to-wear garment, which can be tailored to meet the individual needs of the patient in terms of finger and wrist length, and has been found in reports from patient support groups and therapists (anecdotal evidence) to be comfortable to wear, without reducing dexterity and compression efficacy. **JL**

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