

# FarrowWrap: innovative and creative patient treatment for lymphoedema

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Treatment for the management of lymphoedema is becoming increasingly recognised and standardised in the UK. Through documents such as the International Lymphoedema Framework (ILF) (2006), the International Society of Lymphology consensus document (2013) and the work of both the British Lymphology Society (BLS) and The Lymphoedema Support Network (LSN), treatment is more readily available to patients. Conversely, standardised treatments can inadvertently result in limitations for innovation and creativity to manage difficult and problematic swellings. Thanks to the ILF and the BLS, which have indeed shaped the provision of care for patients, offering a clinical governance framework, therapists are now able to move away from the so-called 'Blue Peter' approach to treatments. Along with changes in funding for the NHS such as Any Qualified Provider (AQP) and the introduction of tariffs, more challenges are placed on therapists to achieve effective clinical outcomes with ever-decreasing resources.

## Innovative therapies

The introduction of innovative therapies such as modern intermittent pneumatic compression (IPC) emulating manual lymphatic drainage (MLD) and low-level light therapy (LLLT) have provided a pathway for improved cost effectiveness. Combined with new bandaging techniques and materials, they assist in the reduction of fibrosis and

increase wound healing, thereby changing approaches to lymphoedema management (Wigg 2009a,b).

The introduction of wrapping devices (for example, FarrowWrap) in the UK in 2008 has assisted in the shift to more cost- and clinically-effective treatment, encouraging self-care in chronic conditions (Jones, 2011). This article introduces wrapping devices such as FarrowWrap and explains how regular use and creative approaches have developed into good practice with improved outcomes within a cost-effective setting.

## Practicalities of bandage strapping systems

The concept behind Velcro strapping systems such as the FarrowWrap is not a new one. The principle of using a bandage to bind around an anatomical structure for support or to secure a dressing has been used in first aid and health care for many years. The many-tailed bandage or Scultetus binder has been used for both animal and human care since the 1950s and probably before (*Figure 1*). Often used to support the abdomen or thorax, the principle of wrapping the tails of the bandage in a cross-over manner is associated with the same technique for applying a FarrowWrap (*Figure 2*). However, the desired effect and purpose have evolved somewhat, with the introduction of new materials to create rigidity, tension, expansion, contraction and effective fastening. In this way its use has become both clinically effective and cost effective.

The FarrowWrap system is designed to replicate that of short-stretch bandaging (Lawrence, 2009). Using FarrowWrap as an alternative to multi-layer lymphoedema bandaging (MLLB) or even compression garments offers more suitable treatments for those who cannot comply with bandaging for physical, social or practical reasons. This system also reduces the need for daily visits by health-care professionals (HCPs) and/or carers, reducing costs and improving efficiency. For those patients who are unable to put on and remove compression garments, it can offer a solution to maintenance therapy as it requires different dexterity to apply or remove.

## Literature

While there is limited research to support the use of FarrowWrap, there is a dearth of anecdotal knowledge from its user base. This article argues that the evidence

## ABSTRACT

The introduction of wrapping devices throughout lymphoedema clinics in the UK has assisted the shift towards a more cost-effective and efficient form of treatment. This article introduces the reader to standardised and creative ways of using FarrowWrap, and explains how it can be used as an alternative approach to the long-term management of lymphoedema and the development of best practice in this area.

## KEY WORDS

- ◆ Velcro wrapping systems ◆ FarrowWrap ◆ Lymphoedema
- ◆ Short-stretch bandaging

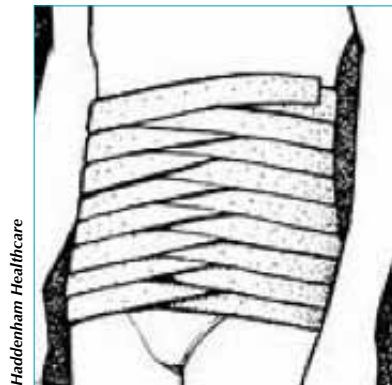


Figure 1. Scultetus binder.



Figure 2. The FarrowWrap.

involving patient and therapist feedback should nonetheless be given the credit deserved of a system or treatment that is making a difference. The evidence provided is supported by the patients presented within this text. Humen-Davey and Mayrovitz (2006) suggest that the FarrowWrap achieves therapeutic compression in line with short-stretch bandaging. Lawrence (2009) found the FarrowWrap to offer more consistency in application and, therefore, that it was more likely to achieve dependable pressure. Wigg (2012) discusses its versatility in treating a variety of lymphatic problems with excellent outcomes and compliance and Langhaus-Nixon et al (2013) show that it achieves a greater reduction in limb volume than that of short-stretch bandaging when used instead of night bandaging with increased compliance.

### What is a FarrowWrap?

FarrowWrap is a patented semi-rigid Velcro wrapping system which uses the principles of Laplace's law to achieve graduated compression. The degree of compression depends on the FarrowWrap selected and is designed to emulate short-stretch bandaging. FarrowWrap consists of multiple overlapping bands interconnected with a flexible

spine. FarrowWrap provides high peaks between working and resting pressures, ensuring performance is similar to short-stretch bandaging and rigid garments (Humen Davey and Mayrovitz, 2006). FarrowWrap is available in two classes in the UK and more styles in Europe and the rest of the world. The FarrowWrap Classic is made of two layers of material ensuring the correct end stretch will apply a compression of 30–40 mmHg. If applied correctly, consistent compression will be achieved. FarrowWrap Lite provides a flexible neoprene material which is both conforming and accommodating of more unshapely skin folds. This applies 20–30 mmHg and is suitable for patients who have mild to moderate, venous, dependency and palliative oedema. It has been used in a variety of settings, including dermatological skin conditions, lipodermosclerosis, epidermolysis bullosa (Clapham, 2012) and wound dressings can be applied underneath if necessary. The introduction of FarrowWrap Strong, which applies 30–40 mmHg but is made from the consistency of the flexible 'light' material will soon be available in the UK. It is used at present in other parts of the world and is providing excellent outcomes (Table 1).

FarrowWrap systems consist of three sections—a foot, a lower-leg and a thigh section. The thigh section consists of two main parts, the Velcro straps and a 'neoprene' bandage which forms a flexible connection between the thigh and lower leg system (Figure 3). Available in off-the-shelf sizes extending to 100 cm and made to measure, the availability in sizes offers flexibility in the large range of limb sizes that the system can be used on. The system lasts up to 6 months and is available on FP10 reimbursement. Although the initial cost for all three pieces is up to £200, it is soon recouped against the cost of individual-use bandaging and professional staff costs, in addition to the advantage to the patient of a more comfortable, less bulky system which offers a greater degree of independence.

### Specifications

FarrowWrap is easy to fit since it only requires two circumference measurements and a length measurement for the leg piece, and two circumferences and a length measurement for the thigh piece. Once measured, the variable size chart allows for the leg piece to be fitted in five sizes and two lengths, a thigh piece in two sizes and three lengths, and a foot piece in five sizes and two lengths.

Application for fitting is done by donning the foot piece first, followed by the leg piece. Stretching the straps to near 'full lock' provides the correct pressure. The most distal strap should be applied first, with the next strap applied by ascending up the leg. For the thigh piece it is easier to apply the straps first and the knee piece last (Figures 3 and 4).

As the garments are sized appropriately, the selection for the appropriate garment for the correct sized limb provides the desired compression.

## Application for treatment

The FarrowWrap can be utilised in a variety of conditions. The remainder of the article will discuss ways in which the FarrowWrap can be used to treat chronic oedema with or without the presence of wounds.

## Management of oedema

Oedema is usually managed in a two-phase process. The first phase is reduction therapy, whereby the limb is reduced with bandages and other therapies. The second phase is maintenance therapy, where the limb is maintained at its new, reduced level. The latter is usually achieved with compression garments (ILF, 2006).

## Indications for FarrowWrap

Box 1 shows indications for the use of FarrowWrap in clinical conditions. These indications must be preceded by a full holistic assessment prior to fitting.

Box 2 outlines the contraindications and cautions to be considered when fitting the FarrowWrap. A holistic assessment will need to be taken prior to the decision to use the wrap.

## Maintenance therapy for chronic oedema

There is some confusion with the terms 'lymphoedema' and 'chronic oedema'. For the purposes of this article, the terms will both relate to a present persistent swelling of more than 3 months' duration (ILF, 2006).

Oedema reduction treatment usually consists of compression using garments or bandaging. Short-stretch bandaging is mainly used to intensively treat oedema, aiming to reduce the swelling, improve any shape distortion and soften any secondary skin or subcutaneous tissue changes. Compression garments are then used to maintain any improvement following intensive bandaging (Linnitt, 2012). However, in clinical practice we are aware of many patients who never manage to cast off their bandages and require long-term chronic management, meaning their circumstances differ from this traditional regime (Wigg and Jones, 2006). Patients with wounds are often maintained in bandaging because the wound fails to heal, exudate results in garments becoming quickly soiled or garments are considered unsuitable for other reasons, such as problems with donning and doffing. FarrowWrap offers another option in that it can be removed at any time, allowing for dressings to be changed or compression to be altered without the need for the expense of a visiting nurse. This ensures that the educated patient is in control of their chronic illness and can maintain their independence while saving on nursing time and resources (Wigg, 2012).

## Intensive treatment

Intensive treatment is undertaken to help reduce limb volume (the size of a limb), reshape a distorted limb shape, help heal wounds and soften thickened tissues, or a combination of these. Bandaging, depending on the

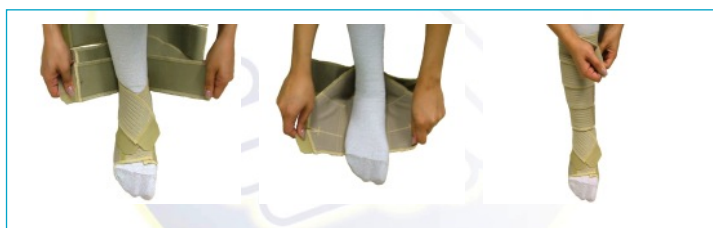
Table 1. Types and characteristics of FarrowWrap

FarrowWrap Classic	FarrowWrap Lite
Rigid, robust material	Light fabric
Soft, patient-friendly feel	Ideal for mild to moderate oedema
Ideal for moderate to severe or stubborn oedema	Suitable for palliative care
Does not roll or crease into skin folds	Venous conditions
Hand wash only	Suitable for children
	Cool and comfortable to wear
	Machine washable



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Figure 3. FarrowWrap systems consist of three sections; foot, lower leg and a thigh piece. The thigh section consists of two main parts, the Velcro straps and a 'neoprene' bandage which forms a flexible connection between the thigh and lower leg system.



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Figure 4. The bandage strapping process.

condition and purpose of the treatment, can be four-layer, multi-layer, partial limb (e.g. below knee), full limb or a system specific to the manufacturers recommendations.

All of these systems require a suitably trained HCP to undertake the process, which is time-consuming and is not always the most cost-effective way to treat the patient. Depending on the system used (for example, multi-layer lymphoedema bandaging), patient contact is often daily

**Box 1. Indications for FarrowWrap**

- ◆ Intolerance to bandaging
- ◆ Intolerance to garments
- ◆ Stubborn oedema
- ◆ Distorted limb shape
- ◆ Post-bandage rebound oedema
- ◆ Weak hand strength
- ◆ Back problems
- ◆ Non-compliance
- ◆ Neuropathy
- ◆ Palliative care
- ◆ Skin sensitivity

**Box 2. Contraindications for FarrowWrap**

- ◆ Infection and acute inflammatory episode
- ◆ Severe peripheral arteriosclerotic disease
- ◆ Decompensated heart failure
- ◆ Deep vein thrombosis

**Proceed with caution with:**

- ◆ Peripheral neuropathy
- ◆ Diabetes

which is both disrupting for the patient and costly to the service provider. While cost should not be the ultimate reason for deciding on the treatment modality, given the current financial climate it is important for both patient and service provider to ensure that resources are used to the best advantage.

Using FarrowWrap for intensive treatment is effective for reducing oedema, resulting in increased interstitial pressure, thereby encouraging reabsorption in the lymphatic system, relieving tension in the venous walls and increasing the effectiveness of activity and improving venous return (Lawrence, 2009).

FarrowWrap offers an alternative to bandaging in the intensive treatment phase of decongestive lymphatic therapy (DLT). It encourages self-care through supervised or supported self-management (SSM) and can therefore reduce the burden on already overstretched service providers. The Lite and Strong versions are machine washable and the Classic version is hand-washable and therefore reusable. Since the FarrowWrap lasts up to a year, provided the patient has at least two sets it can be used continuously instead of bandaging. Dependent on the patient's ability to self-manage, the number of contacts can be reduced to once a week during this phase of treatment. The concept of SSM allows for the patient to carry out an intensive treatment regime under the supervision of a qualified therapist, allowing for successful, cost-effective treatment (Figure 5). This treatment regime is often used with the inclusion of a LymphAssist® as self-application ensuring SSM. In addition to this, the FarrowWrap can

be altered as it loosens and the oedema reduces, which therefore promotes a maintained reduction of oedema or speedier reduction than some other bandaging systems. A cohesive bandaging system, because it adheres to itself, cannot adjust to the smaller limb size and could lead to refill back into the tissues.

Exudate can still be managed effectively with manufacturers' guidelines concluding that most highly absorbent dressings are still able to lock in exudate despite being under a compression system. FarrowWrap has the added advantage that a patient or carer can change dressings to prevent strikethrough without needing professional carers to replace bandaging.

**Phased intensive**

In this phase of treatment for oedema management, due to patient concordance, any comorbidity (such as diabetes), social circumstances (such as requiring time off work), recurrent lymphorrhoea or delayed healing can result in extensive use of resources. Sometimes referred to as 'long-term chronic treatment', the FarrowWrap can assist in reduced costs and improved compliance (Wigg and Jones, 2006). Worn for several hours a day or night and interchanged with compression garments, reduction of limb volume, softening of subcutaneous tissues and reshaping can still occur albeit over a longer period of time. Practitioners might consider this regime of treatment to be ineffective due to difficulties with rebound oedema. However, in practice it has often proved the case that successful outcomes are achieved despite the inconsistent nature of the intervention. Compression garments may need to be supplied more frequently during this regime, because if there is a change in limb volume, improvement of shape or tissue change is dramatic, the patient will require more garment to fit the improved limb. However, as the FarrowWrap is adjustable, it will last longer than needing several garment refits and again assists cost effectiveness and resources.



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**Figure 5. Case study 1: female with bilateral lower limb swelling treated with FarrowWrap system instead of multi-layer lymphoedema bandaging. With kind permission of Singleton Hospital Lymphoedema Service.**

### Case study 1 Phased intensive treatment

A 57-year-old female patient had type 2 diabetes and found being in bandaging very distressing. Using the FarrowWrap allowed her to be able to shower and care for her skin. During the healing phase, although experiencing occasional episodes of increased exudate, she was able to apply the Wrap herself or choose to wear compression garments with an absorbent dressing. This increased her tolerance and subsequently her concordance with treatment, allowing her more freedom as an expert patient (Figure 5).

### Supported self-management

This phase of treatment is based on a similar principle to the phased intensive treatment, except this would be considered self-care as part of a maintenance programme. It therefore would not involve professional carers, but would be instigated by them. In this instance, the patient or their own carer would use a FarrowWrap to 'top up' treatment by applying the wrap over their compression garment during the day for a given time or time period (e.g. one night a week). Again, this regime offers the patient the opportunity to self-manage another treatment modality while maintaining independence and having a degree of self-control over their condition.

### Intermediate care

This phase of treatment using the FarrowWrap refers to patients who have undergone a course of intensive bandaging but cannot, for various reasons (including the need to return to work), continue using bandages while waiting for compression garments from manufacturers. In practice,

there can be as much as 2 weeks' delay before garments are received. This can be difficult for the patient to continue and costly in both time and resources for professional carers. While it is accepted that a garment can be ordered earlier during bandaging treatment, it is not always easy to estimate the limb volume reduction or treatment outcome. The cost incurred by supplying a FarrowWrap at this stage in addition to garments and having undertaken intensive bandaging is justifiable in that it can continue to be used as self-intensive care as described previously.

In this instance, a FarrowWrap also helps to address the problem of rebound oedema. This occurs when swelling returns, usually quickly after a reduction in limb volume and size, when the skin has not had the opportunity to regain some of its own elasticity and compression still needs to be applied over a 24-hour period. In this case, ensuring that the patient is appropriately assessed, the FarrowWrap can be used at night even when the patient has been fitted with their garments to wear during the day. Alternatively, the patient may also wear a FarrowWrap on top of their garment for added rigidity following bandaging (Langhous-Nixon et al, 2013).

### Case study 2 Combination treatment

In this kind of regime a patient is treated partly using part FarrowWrap and partly using bandaging or another appliance to act as an encasement. Figures 6 and 7 show various combinations. There is little evidence by way of research to support this innovative practice. However, in reality, designing patient care for an individual demands specialist practitioners to think laterally and in a problem-solving manner. Providing the principles of compression are adhered to and there are no contraindications to



Figure 6. Patient (a) before, (b) during and (c) after combination treatment.

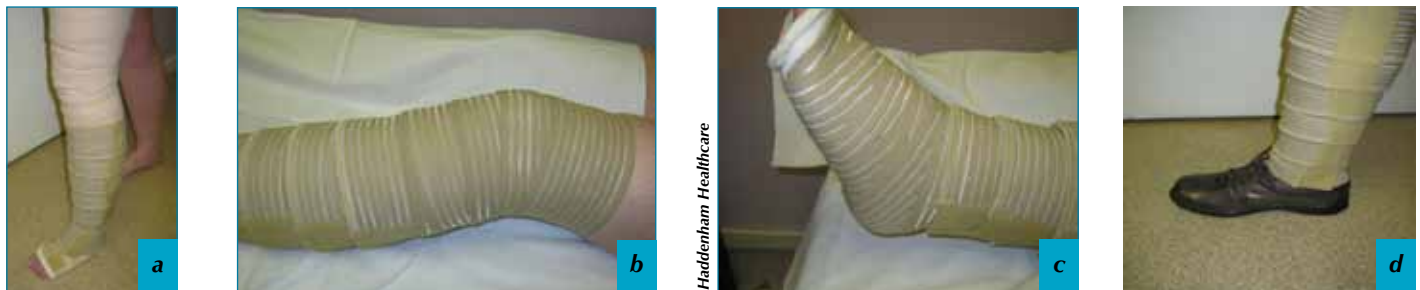


Figure 7. Case study 2: (a) FarrowWrap in conjunction with a cohesive bandaging system; (b) FarrowWrap foot and leg piece used with a Farrow band applied from the top of the leg piece over the knee; (c) FarrowWrap leg piece used with a Farrow band over the foot; (d) patient demonstrates ability to use the bandaging with shoes.

compression, with a degree of caution and informed consent, these strategies can be extremely helpful in meeting patient need. An example of this may be to combine a lower class of compression garment with a FarrowWrap on top (Wigg, 2009a). This can assist when the application of a stronger garment is difficult. Alternatively, the patient may wear a thigh piece in combination with below-knee bandaging to assist with knee swelling from displaced oedema. This will provide a solution for nurses who are not skilled in the application of above-knee bandaging.

### Case study synopsis

A 67-year-old male with a 3-year history of oedema related to multiple sclerosis was treated with the FarrowWrap over a 3-month period. The reduction in swelling was more gradual than using bandaging and was helped by community nurses caring for him with supervision and support from the lymphoedema service. He continues to use FarrowWrap as a 'top up' intensive treatment, in particular wearing the FarrowWrap foot piece over his garments.

Figure 7 demonstrates the use of the FarrowWrap in combination with other methods of compression/containment. It is this creativity and versatility that makes this type of system essential in the management of the patient as an individual. However, this type of practice needs to be confined to specialist intervention, with the practitioner demonstrating better problem-solving skills associated with advanced practice.

Figure 7a demonstrates the FarrowWrap foot and leg piece used in conjunction with a cohesive bandaging system. The bandage is applied straight on to the skin to avoid slippage and as such it is essential that a patch test is carried out to check for allergy.

Figure 7b demonstrates the FarrowWrap foot and leg piece used with a FarrowBand applied from the top of the leg piece over the knee. A FarrowBand is a continuous piece of Farrow strap which, following training, can be applied like a traditional bandage. This was used to help prevent any swelling of the knee as a result of ending compression below the knee and instead of using the FarrowWrap thigh piece. This can be used, for instance, if patients find it difficult to mobilise with a thigh piece in situ. More than one band can be used to extend the support up the thigh.

Figure 7c demonstrates the FarrowWrap leg piece used with a Farrow band over the foot. This is useful for patients who cannot tolerate the foot piece or have such shape distortion on the foot that the band gives better conformity.

Figure 7d uses the combination of the shoe as support for the patient's foot. It is therefore best used if the swelling is mild or as prevention of swelling when wearing the FarrowWrap leg piece. It is essential that the patient understands never to wear the FarrowWrap leg piece without support on the foot, once the shoe is removed.

All of the above combinations can be worn with Microfine toe caps to prevent or improve toe swelling. Toe bandaging would also be an option but is a skilled

technique. It is recognised that some patients do not need support on the toes. However, this needs to be assessed with caution to avoid any unnecessary complications. Microfine toecaps are ultra thin and the fabric is smooth, so, if used in combination with FarrowWrap will also prevent any trauma from bandaging (Close, 2010).

### Conclusion

Wrapping systems provide the nurse with an innovative and creative way to treat patients. Used as a replacement for bandaging to promote independence or reduce nursing visits, or as top-up or intermittent therapy for long-term chronic swelling and difficult to control oedema, it can reduce limb volume, maintain and improve skin conditions and can be easily fitted by the nurse and carer. FarrowWrap uses short stretch technology in a practical and economical way to assist challenges and budgets under new NHS reforms.

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### LEARNING POINTS

- ◆ FarrowWrap is useful where patients do not tolerate bandaging or are unable to apply compression hosiery
- FarrowWrap can be applied to limbs with mild to moderately exuding wounds over a primary absorbent dressing
- FarrowWrap Lite is suitable for patients with venous, dependency or palliative oedema
- FarrowWrap promotes cost-effective and clinically-effective treatment in aiding supervised self-management of lymphoedema

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