The use of compression hosiery in mixed aetiology ulceration and palliative care

Helen Butterfield

The UK has an expanding elderly population, which means that in the future nurses and clinicians who work in community-based units, such as nursing homes and hospices, will increasingly encounter age-related conditions such as palliative oedema and mixed aetiology ulceration. This article looks at duomed soft®, (medi UK, Hereford) a new hosiery solution, which is not only easy to apply, making patient self-care more likely, but also provides consistent mild compression in a format that is more cosmetically acceptable to patients.

KEYWORDS:
Mixed aetiology ulceration □ Palliative care □ Compression hosiery

Compression therapy is a simple principle that, if applied correctly, can have important beneficial effects. Compression can either be applied by bandaging, hosiery or hosiery kits and, if used appropriately, can make a fundamental contribution to the long-term management of venous leg ulceration, as well as having an enormous effect on patients’ quality of life (World Union of Wound Healing Societies [WUWHS], 2008).

There are different compression grades available, with German RAL, French ASQUL and British Standard being the recognised independently tested compression standards available in the UK. Higher compression values are found to be more effective in preventing ulcer recurrence (Dowsett, 2011). However, when patients are elderly and unable to tolerate high compression, the lower values of the British Standard can be a useful resource.

Leg ulceration, of venous, arterial and mixed aetiology, is a significant problem in older people and, as this population grows larger (Posnett and Frank, 2008), it is vital that clinicians are familiar with appropriate management strategies. Similarly, oedema is a common complication of many conditions seen at the end of life, where palliative compression may be appropriate to help ease symptoms (Dowsett, 2011).

‘Compression is a simple principle that, if applied correctly, can have important beneficial effects.’

An understanding of leg ulceration, oedema and how compression therapy can help patients is particularly important in the community, where elderly patients may be isolated, lack support and find it difficult to access healthcare services.

It is also crucial that community clinicians understand the psychosocial element of compression therapy, where patients may find it difficult to adhere to long-term treatment due to the commitment involved in bandaging regimens, as well as cosmetic considerations (Williams, 2010; Anderson, 2013).

This article looks at the causes and symptoms of venous oedema and ulceration, as well as highlighting appropriate management strategies, including an innovative type of hosiery that provides graduated compression in a patient-friendly design, which can help clinicians with long-term patient concordance in elderly patients with existing co-morbidities and end of life care.

VENOUS DISEASE

Chronic venous disease is a common condition in elderly people, which develops when valves that normally allow blood to travel back up to the heart from the lower leg — simultaneously preventing a back-flow of blood into the lower limbs — become weaker, usually through age. This causes a build-up of fluid in the lower limb, which if not managed properly, can result in venous stasis and venous hypertension (Scottish Intercollegiate Guidelines Network [SIGN], 2010). In turn, this can result in subsequent venous leg ulceration, as the blood flows backwards and pools in the legs, increasing pressure in the veins. Initially, this can cause certain ‘mild’ problems, including (Eberhardt and Raffeto, 2013):

¬ Feelings of heaviness in the legs
¬ Aching
¬ Dilated or unsightly veins.

If left untreated, mild venous disease can develop and the patient can encounter more severe problems, including (Eberhardt and Raffeto, 2013):

¬ Swelling
¬ Colour changes in the skin
¬ Dermatological symptoms, such as varicose eczema and recurrent skin infections
¬ Chronic ulcers.

Helen Butterfield, Leg Ulcer/Dermatology Specialist Nurse, Oxford
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Venous leg ulcers are one of the severest complications of venous disease and are the most common type of lower leg ulceration (SIGN, 2010), usually affecting older people. Chronic venous leg ulceration involves considerable morbidity and can have a particularly deleterious effect on quality of life (Persoon et al, 2004; SIGN, 2010). It is also true that healing a venous leg ulcer is only the first stage in what will often be a long-term management plan, including compression, as recurrence rates vary (Anderson, 2013).

**ARTERIAL DISEASE**

Arterial problems develop when the flow of blood through the arteries is impaired. The main cause is build-up of fatty deposits (atheroma) that form plaques on the inside of the artery wall, narrowing the lumen of the artery over time and impeding blood flow (Dowsett, 2006). This, in turn, impairs the supply of oxygen and nutrients to the lower limb, resulting in poorly perfused tissues and, eventually, ulceration.

According to the SIGN guidelines (2010), up to 22% of leg ulcers are caused by peripheral arterial disease, which is indicated by symptoms (see below) does not necessarily exclude arterial disease, although they can also involve diabetes mellitus and rheumatoid arthritis (Ousey and McIntosh, 2008). Mixed aetiology ulcers often occur as a result of chronic venous problems in the lower limb being exacerbated by arterial insufficiency, although Anderson and King (2006) note that the arterial blood supply will not yet be sufficiently compromised to cause critical ischaemia.

**MIXED AETIOLOGY ULCERATION**

As the name suggests, mixed aetiology ulcers have a number of causes, often displaying both venous and arterial insufficiency, although they may be safely used in leg ulcer management using a Doppler ankle brachial pressure index (APBI) measurement. If APBI is less than 0.8 (SIGN, 2010). The absence of cardiovascular disease, or stroke (Stevens, 2004). Mixed aetiology ulcers often occur as a result of chronic venous problems in the lower limb being exacerbated by arterial insufficiency, although Anderson and King (2006) note that the arterial blood supply will not yet be sufficiently compromised to cause critical ischaemia.

**MANAGEMENT**

When treating mixed venous and arterial ulcers, the aim is to achieve a balance between safety and efficacy. Thus, the willing to undergo regular compression can have benefits. The aim of reduced compression is to lessen venous pressure and lower limb oedema, but not to significantly compress the arteries and impede arterial blood flow.

As mentioned above, reduced compression is useful in patients with an APBI of between 0.8 and 0.5 (Anderson and King, 2006), but they should be regularly monitored for pain or a reduction in their APBI. British standard class 1 and 2 compression hosiery can be useful (Anderson and King, 2006), as there is low pressure exerted at rest, but higher pressure on exertion (Stacey et al, 2002).

**Compression in elderly patients**

According to the SIGN guidelines, patients regularly cite problems with pain, discomfort and lack of appropriate advice as reasons for non-concordance with compression therapy (SIGN, 2010). In elderly patients, concordance issues can be exacerbated, due to mobility (patients with poor mobility may find it hard to apply compression themselves) and in some cases, cognitive impairment. Compression bandaging requires a time commitment from patients as well as the willingness to undergo regular application.

Compression bandaging is also dependent on the availability of clinicians who are able to apply it and monitor the patient’s suitability. Similarly, older patients may find it difficult to access healthcare facilities on a regular basis in order to have compression bandaging applied. In some cases, a user-friendly form of compression, such as easy-to-apply hosiery, can be beneficial, as it is easier for older patients to use themselves, although this must be carefully monitored by an appropriately trained clinician.

The appearance of compression bandaging can also be an issue for elderly people, as it can be bulky and easily visible, even under clothing, and restrict their normal footwear.

**Palliative care**

The aim of palliative care according
to the World Health Organization (WHO) is to offer symptom relief and help the person to live as active a life as possible until death (WHO, 2013). Palliative oedema at the end of life can occur as a direct result of a number of conditions, some of which may be terminal, including (International Lymphoedema Network [ILF], 2010):

- Advanced cancer
- Chronic heart failure
- Advanced neurological disease
- Advanced liver disease
- End-stage renal disease
- End-stage chronic respiratory disease
- Human immunodeficiency virus (HIV)/acquired immunodeficiency syndrome (AIDS).

Oedema is a significant problem at the end of life, with up to 67% of patients with advanced cancer, for example, experiencing oedema-related pain (Badger et al, 1988). Oedematous limbs can also cause related pain, for example hip and back pain (ILF, 2010).

Reduced or mild compression can form part of a number of end-of-life management strategies, helping, for example, with reducing oedema through manual lymph drainage and the management of skin conditions (ILF, 2010). Compression can also improve end-of-life patients’ quality of life through cosmetic appearance and improved freedom of movement, both complications of palliative oedema. Compression can form part of exercise routines, where light compression in particular can help with muscle strength and tone and, more generally, with increased venous and lymphatic return (ILF, 2010).

Crucially, responsibility for compression in palliative care should never be passed to the patient (ILF, 2010). End-of-life patients may find removal of bandages and garments difficult and attempts to apply these modalities themselves could result in physical harm such as dislocation, fracture and skin tears (ILF, 2010), as well as psychological distress. Constant monitoring is vital, especially if the end-of-life patient is unable to communicate well.

Hosiery

The aim of compression hosiery is to control oedema by applying pressure evenly around the limb, thereby increasing the rate of venous return (Anderson, 2013). Active leg ulcers are usually controlled with the higher pressures of compression bandaging, and maintained once healed in RAL grade hosiery to reduce recurrence rates (Bowssett, 2011). However, once ulcers have healed, patients are often prescribed compression hosiery, which provides lower levels of compression, to maintain the healed state.

According to a Cochrane review of hosiery and patient concordance, higher rates of compression are more effective, but are rarely maintained by patients (Nelson and Bell-Syer, 2012). The researchers also found that any compression is better than none at all. Therefore, it is recommended that patients should wear the highest rate of compression hosiery they can tolerate, but the minimum should be a UK (British Standard) Class 2 garment (Anderson, 2013).

In the past, cosmetic considerations have played a part in patient concordance with compression hosiery, with many products being bulky, cosmetically unappealing and difficult to apply. As a result, manufacturers have developed different styles and colours and hosiery is available in a number of formats, including (Anderson, 2013):

- Below-the-knee garments
- Full-leg garments
- Socks.

Manufacturers have also developed a number of hosiery styles to make application easier, including inner and outer layers, and products that have zips. These formats represent an understanding by manufacturers and clinicians that patients affected by mixed aetiology ulceration, mild venous disease, or palliative oedema at the end of life, need compression hosiery that is easy to apply.

duomed soft®

Duomed soft® is a new range of British Standard compression hosiery that promotes patient comfort through the use of soft, sheer fabric. It has a silicone top-band (Figure 1), which stops slippage and does away with having to wear prescribed suspenders. Its soft fabric also gives it the look of a non-medical stocking, making it far more cosmetically acceptable to the patient.

The range has a simple selection method, so clinicians can easily choose the right size and option for their patients.

<table>
<thead>
<tr>
<th>Table 1: Compression classes and product codes</th>
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<tbody>
<tr>
<td><strong>Style</strong></td>
</tr>
<tr>
<td>Compression class 1 (cl 1) = 14-17mmHg</td>
</tr>
<tr>
<td>Below knee, open toe</td>
</tr>
<tr>
<td>Below knee, closed toe</td>
</tr>
<tr>
<td>Thigh length with silicone top-band, open toe</td>
</tr>
<tr>
<td>Thigh length with silicone top-band, closed toe</td>
</tr>
<tr>
<td>Compression class 2 (cl 2) = 18-24mmHg</td>
</tr>
<tr>
<td>Below knee, open toe</td>
</tr>
<tr>
<td>Below knee, closed toe</td>
</tr>
<tr>
<td>Thigh length with silicone top-band, open toe</td>
</tr>
<tr>
<td>Thigh length with silicone top-band, closed toe</td>
</tr>
<tr>
<td>Compression class 3 (cl 3) = 25-35mmHg</td>
</tr>
<tr>
<td>Below knee, open toe</td>
</tr>
<tr>
<td>Thigh length with silicone top-band, open toe</td>
</tr>
</tbody>
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**dulomed soft®**
duomed soft is British Standard graduated elastic compression hosiery, which is available on prescription. It is available in five sizes, and in below-knee or thigh-length varieties (Figures 2 and 3). The thigh-length is the only British Standard stocking with a grip top.

duomed soft combines ideal wearing properties and appropriate British Standard medical compression, while maintaining the look and feel of a non-medical stocking. The fabric is soft, sheer, comfortable and easy to apply, thus promoting patient concordance.

**INDICATIONS**

duomed soft is a round-knit fabric indicated for mild venous conditions and palliative oedema. Specific indications for each class available include:

- **Class 1**: superficial varices or thread veins if RAL grade compression is too high for palliative limbs or mixed aetiology
- **Class 2**: varices or post healing of an ulcer when RAL grade compression cannot be tolerated
- **Class 3**: varices and the formation of moderate venous oedema. (duomed soft should not be used in advanced peripheral arterial occlusive disease or pre-gangrenous conditions. Caution should also be exercised in suppurative skin conditions, if the patient is intolerant to any component fabrics or in advanced peripheral neuropathy.)

**PERFORMANCE INDICATORS**

duomed soft is available in a wide range of British Standard sizes. The knee-length stocking comes in both open- or closed-toe versions (open-toe only for ccl3). Other benefits of duomed soft include:

- British Standard elastic hosiery with a hypoallergenic silicone top-band (Figure 1) available on all thigh-length garments
- Easy application, silky feel
- Open- or closed-toe — the open-toe variant comes with Easy-On Slipper
- Three compression classes (ccl 1, ccl 2, ccl 3)
- Below-knee and full thigh-length available in all classes (Figures 2–3)
- Machine washable
- Latex-free
- Simple size selection
- Combines ideal wearing properties and appropriate British Standard medical compression, while maintaining the look and feel of a non-medical stocking
- Offers a seamless, two-way stretch stocking which is highly elastic and non-slip.

‘Manufacturers have also developed a number of hosiery styles to make application easier.’

**HOW TO USE**

duomed soft should be worn during the day and removed at night.

**CONCLUSION**

The UK has an expanding elderly population, which means that in
in an elderly population, soft can help to promote patient concordance in a format that is cosmetically acceptable to patients. In the author’s opinion, innovative products such as duomed soft can help to promote patient concordance in an elderly population, enabling more patients, who otherwise might not have tolerated the higher compression classes of RAL, to be cared for at home.

### KEY POINTS

- Compression therapy is a simple principle that, applied correctly, can have beneficial effects.
- Leg ulceration, of venous, arterial and mixed aetiology, is a significant problem in older people.
- Oedema is a common complication of many conditions seen at the end of life.
- It is crucial that community clinicians understand the psychosocial element of compression therapy, where patients may find it difficult to adhere to long-term treatment due to the commitment involved in bandaging regimens, as well as cosmetic considerations.
- Manufacturers have developed a number of hosiery styles to make application easier, including inner and outer layers, and products that have zips.
- This article looks at an innovative type of hosiery that provides graduated compression in a patient-friendly design.
- duomed soft provides a hosiery option that is not only easy to apply, making self-care more likely, but also consistent mild compression in a format that is cosmetically acceptable to patients. In the author’s opinion, innovative products such as duomed soft can help to promote patient concordance in an elderly population, enabling more patients, who otherwise might not have tolerated the higher compression classes of RAL, to be cared for at home.

### REFERENCES


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### Table 2: Sizes (circumference [cm]) (also, see Figure 4)

<table>
<thead>
<tr>
<th>Size</th>
<th>S</th>
<th>M</th>
<th>L</th>
<th>XL</th>
<th>XXL</th>
</tr>
</thead>
<tbody>
<tr>
<td>cG thigh</td>
<td>42-57</td>
<td>48-64</td>
<td>54-71</td>
<td>60-78</td>
<td>66-85</td>
</tr>
<tr>
<td>cC calf</td>
<td>28-34</td>
<td>32-38</td>
<td>36-42</td>
<td>40-46</td>
<td>44-50</td>
</tr>
<tr>
<td>cB ankle</td>
<td>19-21</td>
<td>22-24</td>
<td>25-27</td>
<td>28-30</td>
<td>31-34</td>
</tr>
</tbody>
</table>

Figure 4. duomed soft circumferences.