Use of Juxta-Fit™ to reduce oedema and promote self-management

Nina Linnitt, Karen Hunt

This article looks at three case reports which show the clinical effects of the inelastic, adjustable device, Juxta-Fit™ (medi UK). This device allows patients to be self-caring and independent. It is also effective in reducing the volume of the lymphoedematous limb and as maintenance therapy following decongestive lymphatic therapy (DLT). Juxta-Fit can be used as a stand-alone treatment, or in conjunction with compression garments if oedema formation is unable to be controlled with compression garments alone. Juxta-Fit offers a comfortable inelastic high working pressure and low resting pressure similar to short-stretch bandaging.

Key Words

Juxta-Fit™ adjustable devices
Self-caring
Cost-effective
Clinical efficacy

Compression garments are used for the treatment of lymphoedema as maintenance therapy after a course of decongestive lymphatic therapy (DLT) to prevent the re-formation of oedema (Damstra, 2010).

There are three important characteristics of graduated compression garments, including:

- Hysteresis
- Elasticity
- Stiffness (Wegen-Franken et al, 2008).

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Hysteresis describes the internal friction between stitches in a garment. It is defined as the loss in recovered linear length of an elastic product when it has been subjected to repeated stretch and relaxation.

Elasticity relates to the capacity of the material to return to its original shape after it has been stretched. Compression garments exert pressure on the leg because of this elasticity, which is related to the extension of the compression yarn, and the circumference of the leg.

Stiffness is the increase in pressure at the 'b' level (the smallest ankle circumference), when the circumference increases by 1cm. The stiffer the fabric, the more effective it is at controlling oedema formation, in the same way that short-stretch bandages are more effective than long-stretch in reducing oedema formation (Hirai et al, 2010).

This article looks at three case reports where compression garments alone were not sufficient to deal with the severity of oedema formation. However, by utilising Juxta-Fit™ devices (medi UK), a lymphoedema service has been able to improve the quality of life for their patients. The device is simple to use and therefore encourages self-care.

What is Juxta-Fit™?

The Juxta-Fit™ range from CIRCAID® (available from medi UK) is an easy to use, patient-friendly, inelastic, adjustable bandage. Juxta-Fit represents a whole range of inelastic, adjustable devices for upper and lower limb lymphoedema.

Styles available in the UK include:

- Below knee
- Knee piece, thigh piece
- Shelf straps
- Circaid below knee
- Juxta-armsleeve and hand wrap
- CURES system for healing ulcers. This has a unique pressure monitoring guide which enables the clinician to apply and maintain a measured dose of compression (i.e. 30, 40 or 50mmHg) effectively.

Juxta-Fit is made from a patented latex-free fabric that has limited stretch. This creates a stiff outer layer which prevents oedema formation. It is breathable and conforms to the shape of the limb, while reducing limb volume. By following the contours of the leg without slipping, it improves patient mobility, concordance and comfort.

The device is placed on the limb and fastened with a series of interlocking bands known as 'Juxta-lock' (*Figure 1*). These guarantee simple application for

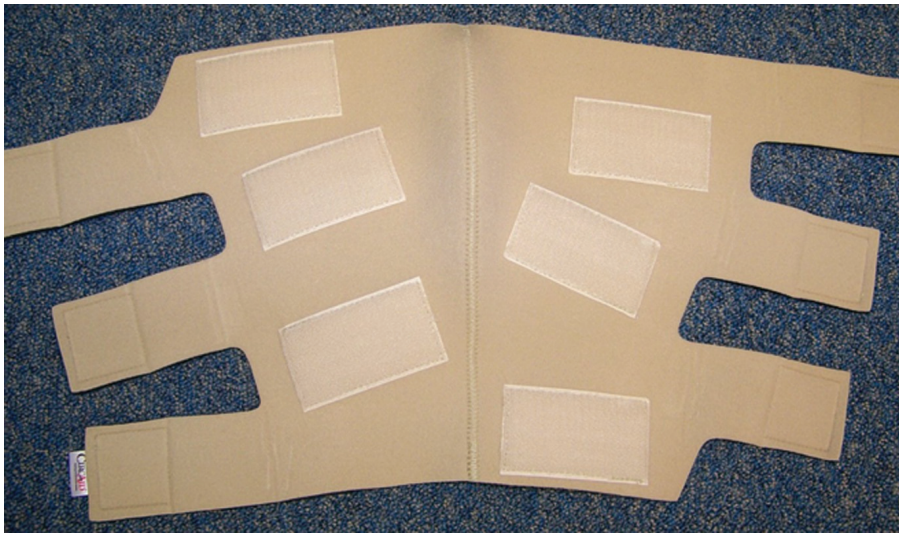

Figure 1. Juxta-Fit interlocking system.

patients and/or carers as the device can be easily readjusted throughout the day without having to undo the entire garment, thereby promoting self-management. The more a patient is able to readjust throughout the day, the greater the volume loss in the limb, resulting in improved patient outcomes and quality of life.

Adjusting the bands of the device to a firm and comfortable fit achieves therapeutic levels of compression and it can, if necessary, be worn for 24 hours with the bands being slightly loosened for night-time wear.

Juxta-Fit is specially designed to use varying bandwidths to ensure compression throughout the entire length of the device, regardless of limb shape. It is 100% machine-washable and has a one-year warranty.

The next part of this article discusses the use of Juxta-Fit™ legging for lower limb oedema, the Juxta-Fit™ shelf strap for foot oedema and the Juxta armsleeve for upper limb lymphoedema.

Juxta-Fit™ legging

The legging system incorporates latex-free materials with a simple patented design to create a comfortable and effective compression device. These are available through medi UK, hospitals or on prescription (FP10/GP10). The sizes range from S–XXL, with extra wide calf variants for those with proportionately larger calves, going from an ankle circumference of 15cm to 43cm and a calf size of 30cm up to 66cm circumference.

The edges of the lower limb legging are brought together and can be re-adjusted throughout the day, enabling the wearer to actively reduce the volume of their lymphoedema. Due to the design, the garment straps can be individually readjusted, as opposed to having to remove the whole garment to reapply it.

In other scenarios, the device can be used instead of compression, or as well as compression to maintain a reduced limb volume.

Once fitted, the Juxta-Fit device is comfortable to wear, efficient at stopping oedema formation as well as drying up lymphorrhoea (Jones, 2011). The latter is achieved by its inelastic wall which prevents oedema from pooling. If oedema is not allowed to stay in one area, it moves out of the limb, which reduces pressure in the tissues and therefore on the skin, with the leaking lymph drying up.

Shelf straps

Shelf straps can be bought individually and have a variety of uses, the main one being to offer more stiffness to an overhanging distorted shape. When the underlying tissues are firm and fibrosed, the skin loses its elasticity and skin folds occur. It is important during multilayered lymphoedema bandaging (MLLB) to pack out these areas with foam or padding to reshape the limb. However, using a shelf strap on top of Juxta-Fit, will offer more stiffness and help to correct the shape. A shelf strap is anchored on top of the Juxta device below the swelling/distortion, and tension is applied to the strap which is pulled up with the other end being anchored above the distortion. Shelf straps are available through medi UK, and are part of the Juxta-Fit range. They come automatically in made-to-measure Juxta-Fit garments, but can be bought separately.

Juxta-Fit™ in practice

Case report one

Mrs A was a 53-year-old female with a three-year history of lymphoedema to her right leg following surgery and radiotherapy for uterine cancer. In August 2010 she had an excess limb volume of 50% in the affected limb, compared to the contralateral limb. She had been prescribed a below-knee, made-to-measure flat-knit garment in compression class 2.

This was changed to a thigh-length flat-knit garment in compression class 3 and the option of two weeks' intensive treatment of DLT, with the aim of reducing the excess limb volume and reshaping the limb.

However, the course of DLT was not a viable option due to Mrs A's work commitments.

She was reviewed after one month due to the change in garments from below-knee to thigh-length, and the affected limb was slightly reduced, 45% larger when compared to the contra-lateral limb.

At this time, more discussion took place between the lymphoedema therapist and the patient regarding a course of DLT, but was still not a viable option due to her work.

At review three months later, it was found that the excess limb volume had now increased to 60%.

Figure 2. Excess volume of 70% compared to contralateral limb.

At Mrs A's next review she presented with firm, non-pitting oedema from ankle to knee, her foot was not affected, and the thigh region was soft, non-pitting underlying tissue.

The oedema was much worse to the lower limb and the excess limb volume was now 70% (*Figure 2*). It was felt that the tissue changes in the lower part of the leg had increased her risk of developing cellulitis.

The new plan of care was to try Juxta-Fit to the lower leg over the top of her flat-knit made-to-measure garment (*Figures 3 and 4*). She was advised to readjust the Juxta-Fit hourly initially, and to wear it as much as possible during the day.

After one month of wearing Juxta-Fit as advised, Mrs A felt that her leg was softer. The limb volume measurements showed a reduction of 30% down to 40% excess compared to the contralateral limb and, more importantly, the tissues were soft and mobile. The foot remained the same and oedema had not increased in this area.

Overall, Mrs A had lost 3870ml of fluid from her swollen limb in three months with the introduction of the Juxta-Fit.

Figure 3. Lymphoedematous limb with Juxta-Fit applied.

Figure 4. Back view of the device, the Velcro bands can be individually re-adjusted for optimum comfort for the wearer.

Table 1

Excess limb volume for Mrs A, before and after using Juxta-Fit

Date case report one	Excess limb volume	Condition of underlying tissue	Compression	Juxta-Fit
August 2010	50%	Soft	Ccl 2 below-knee	
September 2010	60%		Ccl 3, thigh-length	
January 2011	55%	Softer	Two weeks of MLLB	
April 2011	70%	Firm, non-pitting	Thigh-length Ccl2	Juxta-Fit fitted below knee on top of flat-knit compression
May 2011	40%	Softer		Wearing Juxta-Fit through the day at work, and in the evening
July 2011	40%	Soft and very mobile tissue		Continues to wear Juxta-Fit. Feeling it holds the oedema unlike compression garment alone

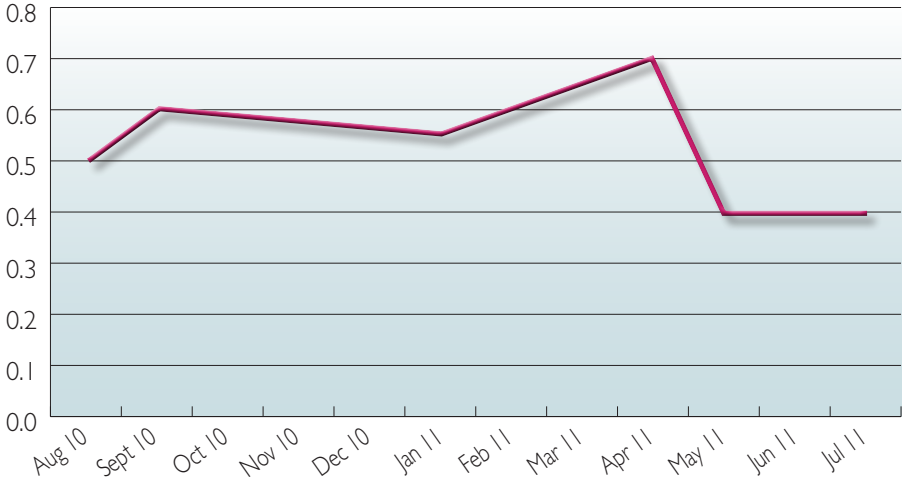

Figure 5. Volume loss from April 2011 when Juxta was fitted.

Table 1, Figure 5 show the excess limb volume for Mrs A, before and after using Juxta-Fit.

Conclusion

Mrs A had not been able to contain her oedema with just compression garments in flat-knit material. However, the Juxta-Fit device had a beneficial effect. It suited her lifestyle and work commitments, and also resulted in the greatest loss of volume in over a year. She commented that she had more self-esteem and felt more confident in everyday life. She was able to shop for trousers more easily which overall improved her quality of life.

Case report two

This case involved Ms B, a 43-year-old female with a longstanding history of below-knee bilateral lymphoedema since the age of five.

Ms B had been born with a condition which led to her being wheelchair-dependent. She spends many hours a day on a computer, not only for her work life, but also to communicate socially on other networks in her free time. Her computer work was thus her lifeline, but she did not have the space to elevate her legs when working on it.

In 2001 she experienced difficulties with her left foot which prevented her from being able to mobilise independently, as she was unable to wear shoes and callipers. Over the following two years her oedema gradually worsened.

Ms B had worn below-knee, made-to-measure, flat-knit class 3 compression garments with intermittent courses of multilayer bandaging in the past.

She had a distorted foot shape with an area of stubborn oedema to the distal part of both feet. The oedema hung over the toes and was more prominent on the dorsum of the foot (*Figure 6*).

The decision was made by Ms B and her lymphoedema therapist to try the Juxta-Fit ankle foot wrap, as the foot wrap ends at the base of the toes, which is where Ms B had the most difficult area of oedema. It was decided to trial the use of the shelf straps in an innovative fashion; the aim being to add a wall around the dorsal swelling, without creating a tight squeeze over the potentially vulnerable toe area.

Figure 6. Distorted foot shape.

Her foot was measured, and she fitted easily into an 'off-the-shelf' medium-sized foot wrap (*Figure 7*). This was trialled on the right foot.

The shelf strap was used by anchoring one end on the plantar aspect of the Juxta-Fit footwrap and bringing it over to anchor the other end on the dorsal aspect (*Figure 8*). This was achieved without any pressure or risk of pressure on the great toe. In fact, the strap missed the toes completely due to the severe swelling present.

When the ankle foot wrap was applied, Ms B was warned that there was a likelihood of the ankle increasing in volume, as the foot would be unable to decongest. Ms B was happy to see how it went and deal with any secondary occurrences should they be problematic at a later date.

At follow-up two months later, the oedema to the right dorsum was softer and the size had reduced. Her toes were now all visible; they had not been visible since 2002. The decrease in fibrosis (firmness) resulted in a reduction in the risk of cellulitis because the stagnant lymph fluid was now being moved out of this vulnerable area. The size of the foot had reduced so much that the size of the Juxta-Fit needed to be changed to a small.

Due to the removal of fluid from this distal point, where the device ends, swelling had begun to accumulate, as predicted. However, Ms B was so delighted with the positive effects of the foot wrap, that she was happy to wear the Juxta-Fit legging to chase the oedema out of the ankle area.

Figure 7. Juxta-Fit ankle footwrap with shelf strap anchored at the plantar aspect.

Figure 8. Juxta-Fit ankle footwrap with shelf strap *in situ*.

Conclusion

In this case, DLT and follow-up flat-knit garments had never achieved a reasonable reduction in limb volume or improvement in shape, especially in the foot. Juxta-Fit was chosen because it was necessary to have stiffness, rather than compression in this area. It fitted well with Ms B's lifestyle and it was able to reverse a dependent oedema, which had disfigured the dorsal aspect and the toes. The result was pleasing for Ms B, who was able to continue with her hobby and lifeline of using her computer.

Case report three — Juxta-Fit™ armsleeve

Mrs C was a 47-year-old female with a two-year history of lymphoedema to the left arm following surgery and radiotherapy for breast cancer.

She was first assessed by the lymphoedema service in January 2010, when she was given information on skin care, exercise and a class 1, circular-knit compression armsleeve.

Mrs C was not keen to wear the sleeve during the first year, and so the excess limb volume measurement increased from 17% compared to the contralateral limb, to 55% over 12 months.

In April 2011 a course of manual lymph drainage (MLD) was given, and she was also taught a simplified version (SLD).

In May 2011 she had one week of DLT which resulted in a reduction in volume to 29% excess, compared to the contralateral limb. The compression sleeve was changed to class 2 and daily SLD was encouraged.

At her one-month review the volume had increased to 38% and there was firm, non-pitting oedema to the lateral forearm and elbow.

Mrs C was measured for a flat-knit class 2 sleeve and had her second course of DLT one month later.

After 10 days of DLT, her excess limb volume had reduced from 38% to 26%.

Figure 9. Juxta-armsleeve.

The lateral forearm oedema was softer and she was fitted with a class 3 made-to-measure garment. She was also provided with a Juxta-Fit armsleeve and advised to wear it as much as possible in place of the compression garment (*Figure 9*).

At her one-month review she was wearing the Juxta-Fit armsleeve four days a week as well as in the evenings. She reported that the Juxta had the ability to soften the forearm, especially around the lateral forearm and elbow. She also found the ability to readjust it when necessary throughout the day beneficial to the overall feel of her limb.

The volume continued to decrease with the use of the Juxta-Fit armsleeve. Concordance to prescribed treatment is also increased with the armsleeve, as there is a detachable elbow strap which can be removed if the wearer has a job that requires the elbow to be bent, for example during typing. Once the wearer changes that activity, the elbow strap can be replaced to prevent any oedema formation around this site.

Mrs C found at times that her hand would swell. Although there are Juxta-Fit handwraps available for this situation, the Juxta-Fit armsleeve can also be used in conjunction with a flat-knit glove, which was a more preferable option for Mrs C when necessary.

Conclusion

Mrs C found the Juxta-Fit armsleeve easy to fit and adjust throughout the day. The stiffness that it offered had a beneficial effect on the lateral and elbow oedema formation that her previous compression garment had not been able to reverse.

This treatment regimen enabled Mrs C to lead an independent life and control her lymphoedema without the need for further courses of DLT. The arm became stable at 26% excess limb volume using the Juxta-Fit armsleeve.

Overall considerations for practice

The benefit of using the Juxta-Fit inelastic adjustable device is that the wearer has more control. Once it loosens, it is easily readjusted, thereby ensuring that there is a constant, supportive stiff outer layer to prevent oedema reformation.

This reduces the risk of cellulitis as well as improving limb shape, without having to take independence away from the wearer by bringing them into the clinic for regular courses of DLT.

While courses of DLT are tailored to the individual, they may not be a treatment regimen that suits everyone, either from the limitations of the service or from the patient perspective. Undertaking a course of DLT is time-consuming, which can prove difficult when trying to get time of work, or expensive with potential costs involved in travelling to the clinic. The Juxta-Fit range can be seen as a viable option, either as a stand-alone garment or in conjunction with compression garments, to offer a comfortable treatment which is efficient in reducing and maintaining limb volume measurements.

Due to its application of wrapping around the leg (or the loose, cylinder of the Juxta-Fit armsleeve), it is also effective for patients who are unable to physically pull on compression garments due to comorbidities (e.g. arthritis, etc). The device can easily be applied and adjusted even in this complex group of patients.

Key Points

- Juxta-Fit can be used as a stand-alone treatment, or in conjunction with compression garments if oedema formation is unable to be controlled with compression garments alone.
- The benefit of using the Juxta-Fit inelastic adjustable device is that the wearer has more control.
- Juxta-Fit offers a comfortable inelastic high working pressure and low resting pressure similar to short-stretch bandaging.

The Juxta Fit range offers therapists another device in their toolkit to deal with lymphoedema/chronic oedema. It promotes independence, allowing patients to take ownership and manage their condition without relying on regular visits to clinic, all of which can help to promote quality of life, promote self-esteem and maintain independence. JL

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