

Multinational, pilot audit of a Velcro adjustable compression wrap system for venous and lymphatic conditions

S. Ehmann, J.C. Whitaker, S. Hampton, A. Collarte

Published: JWC Sept 201625(9)

Abstract

Objective: The aim of this small pilot audit was to record the performance of an adjustable Velcro compression wrap, ReadyWrap™, and the experiences of patients and healthcare professionals using the system as a self-care option for the management of venous and lymphatic leg conditions in both the treatment and maintenance phases.

Method: This audit was held within a 4-week review period. Participants included venous leg ulcer (VLU) patients with and without oedema, and patients with lymphoedema. Where open wounds were present they were managed with debridement, skin care and dressings according to clinical need. Lymphoedema patients received manual lymphatic drainage and skin care regimens as per standard practice. The Velcro system evaluated formed part of a treatment pathway with compression bandages and/or compression hosiery as clinically indicated. Patients, carers and healthcare professionals applied the garments following assessment and training. Objective data recorded included change in circumferential measurements and improvement in wound status. Observation of health care professionals, patients, and carers with regard to comfort and ease of application/removal of the device were recorded.

Results: There were 17 patients included in the audit. Within the 4-week period a reduction in limb circumference was recorded in all cases. Improvements in open wounds were recorded in most cases. Following the 4-week audit period 94% of the application of the device was performed by either the patient (59%) or the carer(35%) thereby reducing the health-care professional contact that was required.

Conclusions: Early results in this small audit demonstrated that this adjustable Velcro compression wrap may provide a simple, clinically effective and patient-acceptable solution for self care with compression. Use of this type of device could have the potential to reduce overall health care burden by reducing the necessary skilled treatment visits and/or cost while still achieving good clinical outcomes. Further studies are required to confirm this pilot study and provide additional data.

Materials and Method

ReadyWrap™ is a Velcro wrap used as an alternative or supplement to traditional compression bandages or hosiery and is positioned as a management solution for the treatment and maintenance of patients with chronic venous disease with and without edema. The calf piece and liner were used with each patient. For those with foot edema, a foot piece and/or hybrid liner were added to the system. Additionally, some patients with swelling in the thigh used a thigh Velcro wrap (Figure 1).

Unique features of this Velcro wrap system include a wide blocked spine and color-coded short straps that fastened in the front of the limb enabling them to be seen clearly (figure 2).

Prior to audit, the physical properties of the Velcro wrap were studied using the validated Picopress pressure monitor. Findings of these tests revealed that when applied according to the manufacturer's standardized application method, the pressure profile of this particular wrap were similar to a short stretch bandage system with high working and lower resting pressure.

Following local permission at each site the audit was performed in three centers in the UK and one in the US and include patients with venous and lymphatic conditions with varying degrees of tissue density and mobility (Table 1).



Figure 1

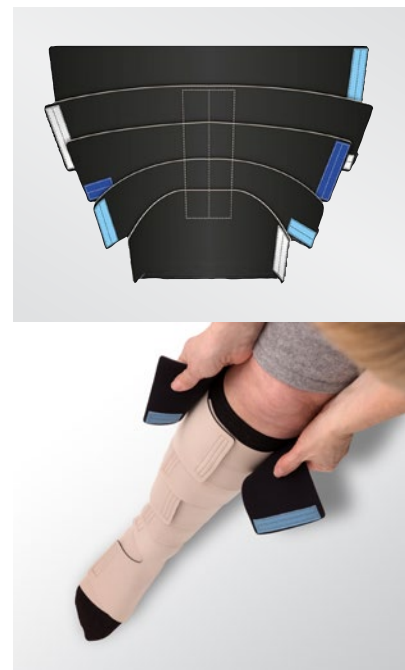


Figure 2

Patient Examples

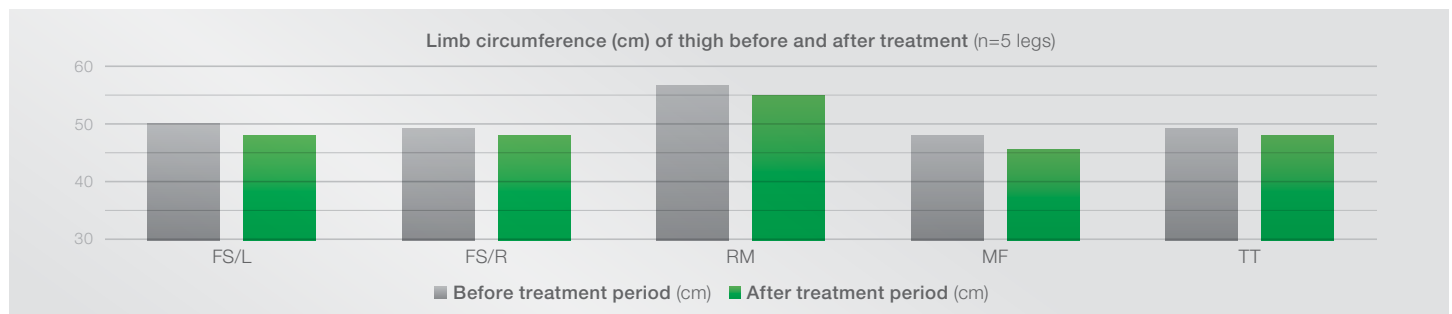
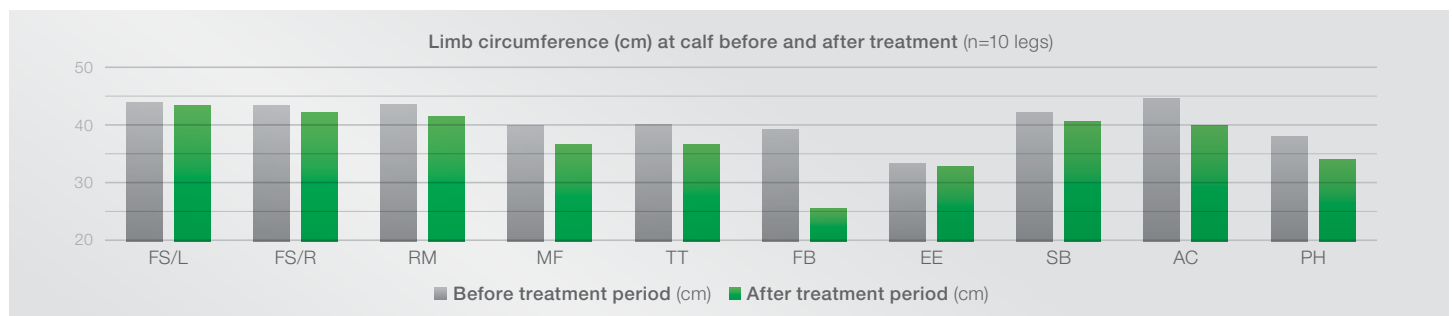
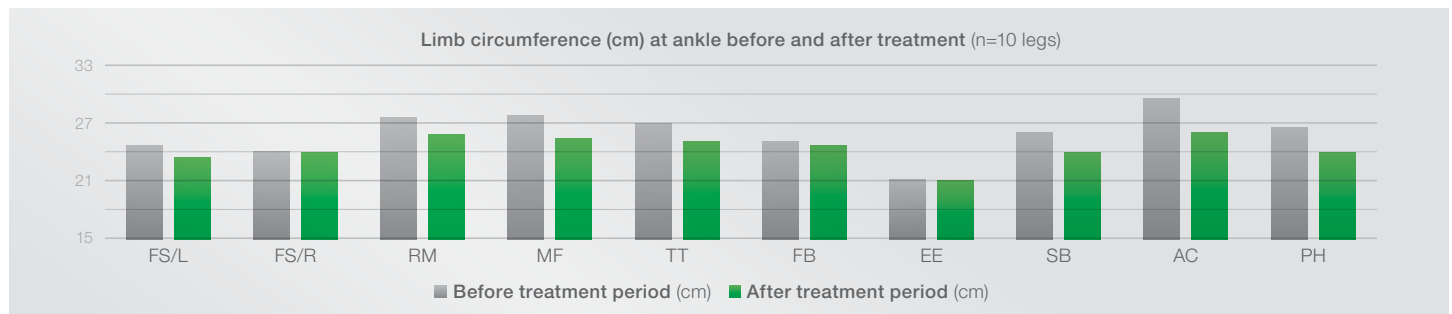


Table 1. Patient Characteristics

ID	Mobility	Time	Cause	VLU	Oedema	ISL	Hosiery	Bandages	Wraps	Other
FS	Mobile	6 weeks	Lympho x2 Venous		X	Late 2	X			
SA	Wheelchair bound	?	Lympho Venous		X	Late 2	X	X		
RM	Restricted Mobility	>5 years	Lympho Venous	X		Late 2	X	X		
MF	Restricted Mobility	>5 years	2° Lympho		X	2	X			
TT	Mobile	1 year	lymph		X	?	X			
KS	Mobile	>1 year	VLU	X		1		X		
FB	Restricted Mobility	3 months	VLU	X		1		X		
EE	Restricted Mobility	?	VLU	X		1		X		
SB	Mobile	13 months	V Lymph gravit x 2		X	1-2	X	X	X	
HG	Mobile	9 months	Gravit x 2		X	1-2	X			
AC	Mobile	New Patient	Gravit x 2		X	1-2	None			
DC	Mobile	13 years	VLU	X		1		X		
JH	Restricted Mobility	3 months	VLU	X		1	?	?		
JJ	Mobile	6 months	VLU trauma	X		1-2		X		
PH	Restricted Mobility	1 year	Gravit x 1		X	2			X	
WV	Wheelchair bound		Lympho		X	Late 2		X?		
LIP	Mobile		Lympho		X	Late 2		X?		

Results

Volume Reduction



Results

Changes in Tissue Texture



Initial Presentation*



Note softening of the tissue with use of adjustable Velcro Wrap*



Adjustable Velcro wrap in situ*

*Photo courtesy of Northern Lymphology, Ltd.

Feedback From Participants

Patient comments

- Looks natural and feels comfortable.
- Felt lighter than previous compression with bandages.
- Did not like the thigh piece; it felt bulky (very active patient).
- Patient liked the wrap because she could remove it before taking a shower and it allowed her to continue therapy while waiting for stockings even though the clinic was closed.

Clinician comments

- It is very easy to apply.
- I am convinced I achieve pressure easily, it never cuts into skin folds.
- The foot piece is bulky for some patients who wish to wear normal shoes.
- Initially could not fit into shoes due to swelling on either foot, within 2 sessions was able to get into shoes.
- Much easier to apply than compression hosiery for some patients with limited dexterity. Easy for patients, family to apply after one training session.
- Preferred it to other wraps because of easy application.

Overall comments

- Volume decreased within a few treatment episodes.
- Wound improved within a few treatment episodes.
- Reduced clinic visits.

Patient ID	Treatment Duration	Tissue Density
Lymphedema patients		Firm / Moderate / Soft Tissue changes during the treatment period
FS - RLE	4 episodes	Firm → Moderate
FL - LLE	4 episodes	Firm → Moderate
RM - RLE	4 episodes	Moderate → Soft
MF - RLE	10 days	Firm → Soft
TT - LLE	10 days	Moderate → Soft

Experience

	Really Liked	Liked	Similar to other Velcro Products	Not Recorded
Appliers'				
Ease of application with color coding	10/11	1/11		
Adjustability on application	10/11	1/11		
Re-adjustability to limb size	8/11	3/11		
Overlap system with no gapping	8/11	2/11	1/11	
Blocked spine for stability	7/11	1/11		3/11
Wearers'				
Ease of mobility	12/13	1/13		
Form maintained with blocked spine	10/11	1/11		

Discussion Highlights

Desirable characteristics for a compression product include a short-stretch compression profile that maximizes vascular hemodynamics. It should be comfortable and easy to apply/remove. The compression modality should be durable with an extended use period and reasonable in costs. The result of this small pilot audit would offer some encouragement that the Velcro wrap product reviewed would be able to meet these demands.

- Although not part of this formal pilot audit, validated assessment of the Velcro wrap used demonstrated that it met short-stretch compression profile with static stiffness index >10 which was maintained over 24hr period. It has been well documented that short-stretch compression profile provides for optimal hemodynamic efficiency to maximize VLU healing and reduction of edema.²⁻⁴
- With regards to ease of use, the participants, (health-care providers and patients/caregivers), reported the Velcro wrap used in this audit was easy to apply/remove. A general criticism of Velcro wraps is that elderly patients do not have the strength and/or dexterity to apply the wrap with consistent pressure to be effective. The design of this product offers a viable alternative with wide straps that overlap eliminating the need for interlacing, or pulling in opposition direction simultaneously in order to achieve proper fit. The participants in this audit were able to appropriately apply the device after instruction, which allowed them to actively participate in their care, perform daily hygiene at home when needed, and adjust the wrap for more snug fit as swelling was reduced. Additionally, the option of a full under-stocking with compression only in the foot minimized the number of pieces they were having to apply. Self-application and the adjustability of the garments provided the opportunity for patients to take control of their care, promoting independence and involvement. This demonstrates the value of this technology for elderly patients who

may be able to participate in their own care or who may have nonmedical assistance.

- The financial implication of incorporating the device into a compression treatment regime cannot be overlooked. The role of the reviewed Velcro wrap to reduce clinic visits from three times a week to twice a week and then to once a week in some cases have cost implications for those patients with co-pays/visit as well for clinic efficiency where available appointments may be limited.¹
- Finally, the audit results highlighted aspects of good compression therapy such as stability of gait. In previous US conference posters two physical therapists recorded improvements in gait and stability with the wrap using the validated Timed Up and Go test.^{5,6} The scores of 20 seconds reduced to 10 seconds had significant implications for improvements in mobility and the reduction in the risk of falls.
- Compression bandaging may still be the most effective solution in the initial stages of oedema management for limb shaping or softening, or if the wound requires frequent dressing changes to manage excess fluid or significant infection. However, adjustable Velcro wraps could have an important part to play in managing the limb in the semi-acute conditioning phase before, or in place of, final transition to hosiery.

Limitations

Limitations of the current audit include small sample size, lack of homogeneity of the patient population, and multiple outcomes measures. More complete data on wound measurements, volume measurements and patient characteristics would have been useful. This small pilot audit does establish the use of the product across the continuum of compression, in multiple health-care settings across the globe. A large observational study could provide more information on the clinical practice with this technology within the compression pathway.

Conclusions

Self care, management by trained relatives or inexpert wound care professionals, for the right patients, with the appropriate training, may provide the solution to an increasing demand for care in a world of dwindling resources. This is only possible with therapies that lead themselves to simple methods of use and the support from manufacturers to provide training, clear instructions and ongoing on customer care. The Velcro adjustable wrap compression wrap as a simple solution has the potential to save costs by reducing treatment times, facilitating self-care and early resolution with transfer to hosiery for long term care. More importantly, patient participation and comfort improve concordance and independence. ■

References

1. Williams, A. A review of the evidence for adjustable compression wrap devices. *J Wound Care* 25: 5, 242–247.
2. Mosti, G., Cavezzi, A., Partsch, H., et al. Adjustable Velcro compression devices are more effective than inelastic bandages in reducing venous edema in the initial treatment phase: a randomized controlled trial. *Eur J Vasc Endovasc Surg* 2015; 50: 3, 368–374.
3. Harding, K., Expert working group. Simplifying venous leg ulcer management. Consensus recommendations. *Wounds Int* 2015; <http://bit.ly/1r1uMdy>.
4. EWMA Position Document – Understanding compression. 2003; <http://bit.ly/2bgdCnG> (accessed 22 August 2016).
5. Ehmann, S. (2016) Improving Edema and Functionality using a new adjustable compression wrap. Poster presentation at SAWC, Spring Conference 2016; Atlanta, US.
6. Bock, K.J. Adjustable compression wraps with overlapping straps can prevent ulcer re-occurrence in phlebo-lymphedema: a case series. Poster presentation, SAWC, Spring Conference 2016; Atlanta, US. U

Declaration of interest: Lohmann & Rauscher GmbH provided financial support to the project, assisted with the protocol and supplied the materials.