Variability in post application interface pressure of a two-layer compression system

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INTRODUCTION

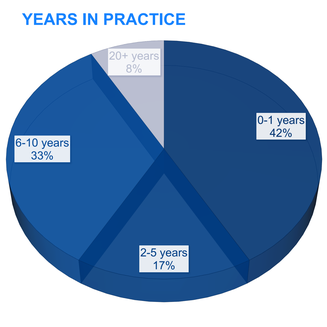
The established goal of therapeutic compression is to apply 30-40mmHg; however, without real time feedback of compression level, even experienced wound specialists are known to apply compression levels outside of this range; healthcare staff turnover, specialist and primary care shortages, and access disparities are known to affect wound care patients including those in need of compression. Previous investigation of a unique pressure indicator system* revealed 85% of nurses applied these two-layer compression wraps correctly on the first application. The pressure monitor clinical tool was selected for measurement of interface pressure to bring greater transparency to applied bandages and wrap pressure with the goal of reducing inter- and intra-provider variability of compression bandage and garment application.

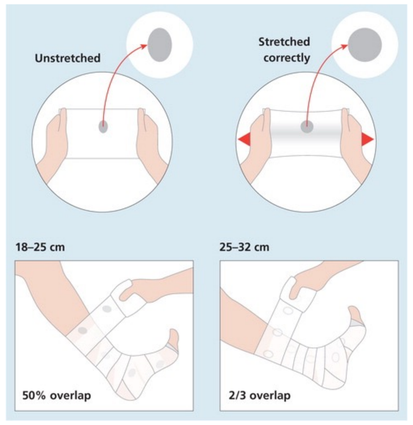
METHODS

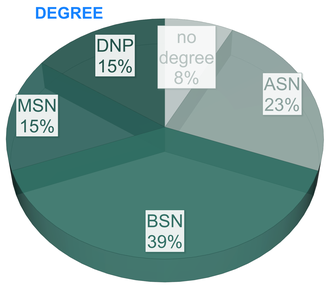
A group of wound specialists convened to evaluate variability in post-application interface pressure of a two-layer compression system with a pressure indicator system. An applicator survey was distributed to collect additional data. Two applications of the system were observed and interface pressure levels recorded. The first application occurred without instruction on use, the second following minimal instruction on use including how to confirm correct stretch and overlap required.

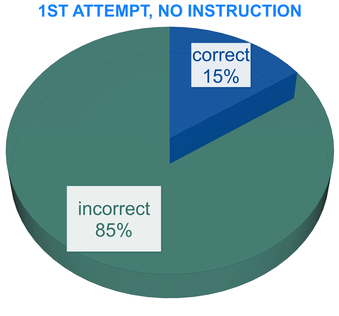
The Juzo Pressure Monitor clinical tool was used to objectively measure the delivered dosage of interface pressure under two-layer compression wrap system. Prior to applying the two-layer compression wrap system, the pressure monitor gauge and wand was applied to the lower extremity at calf level. Resting interface pressure immediately following application were recorded.

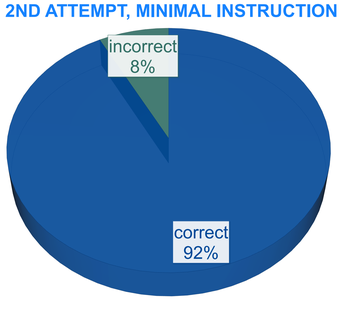
The compression application survey results assisted with identification of additional applicator variables potentially influencing therapeutic pressure application of the compression wrap on the first or second attempt including: educational level, certification status, years in practice as a wound specialist, historical frequency of 2- or 4-layer compression wrap system application. Additional information collected comprised the dosage of compression applied in mmHg and the perceived ease of application from 1-5 on a Likert style scale. Feedback including comments and additional findings were also solicited.











- “this was my first time wrapping and it was an easy nice step for step application”
- “love the oval to circle”
- "circles really improved my wrap"
- “very different than what I’m used to. I did like the dots”
- "fantastic idea w/circles to help w accuracy; surprised how easy to get high wrap mmHg rate”

RESULTS

Reported educational preparation included doctoral (15%), masters (15%), bachelors (39%), associates (23%), and no degree (8%). Participants reported years in practice including 0-1 years (42%), 2-5 years (17%), 6-10 years (33%), and 20+ years (8%). Reported prior experience in compression application of any kind included daily (n=5), several times per week (n=4), and less than monthly (n=2). An additional finding was the need verify Juzo pressure monitor bladder integrity utilizing a sphygmomanometer or similar device. A total of 4 Juzo monitors were available for use for the study, and 2 were noted to give erroneous readings due to bladder malfunction.

Group (n=13) mean interface pressure following 1st application was 38mmHg (SD=19); 95% confidence interval: ±10.659 (±27.94%). Correct application occurred in 15% of participants. Mean interface pressure following minimal instruction on use and 2nd application was 35mmHg (SD=6; 95% confidence interval ±3.292; ±9.40%). Correct application occurred in 92% of participants. Interface dosage of single outlier in second application: 23mmHg.

DISCUSSION

The combination of short and long stretch compression delivery in the product evaluated delivered a massage-like effect while walking and moderate pressure at rest, which is known to be better tolerated, especially at night. The presence of a unique pressure indicator system within the compression wrap was evaluated on its ability to assist clinicians achieve therapeutic pressure application with the correct and consistent level of stretch. Following minimal instruction all users with variable experience and educational preparation were able to safely apply compression, 92% within the goal range, to provide safe and therapeutic compression therapy. The dual compression system’s ability to provide consistent, safe, comfortable compression makes it a valuable tool across care settings.

REFERENCES

1. European Wound Management Association (EWMA). Position Document. Understanding compression therapy. London: MEP Ltd; 2003:13-14.
2. O’Meara S, et al. Compression for venous leg ulcers. Cochrane Database Syst Rev. 2012;14;11:CD000265.
3. Young T, et al. UrgoKTwo® Compression Bandage System made easy. Wounds Int. 2013;4:1-6.
4. Jünger M, et al. Comparison of interface pressures of three compression bandaging systems used on healthy volunteers. J Wound Care. 2009;18(11):474-80.
5. Benigni JP, Lazareth I, et al. Efficacy, safety and acceptability of a new two-layer bandage system for venous leg ulcers. J Wound Care. 2007;16(9):385-90.
6. Hanna R, Bohbot S, Connolly N. A Comparison of interface pressures of three compression bandage systems. Br J Nurs. 2008;17(20):S16-24.
7. 7. Lazareth I., et al. Efficacy of Two Compression Systems in the Management of VLUs: Results of a European RCT. J Wound Care. 2012;21(11):553-65
8. Tai HQ, Chaen LCR, Boey J, et al. A dual pressure indicator, two-layer compression system for treatment of venous leg ulcers: a review. J Wound Care. 2021;30(Sup12):S6-S12. doi:10.12968/jowc.2021.30.Sup12.S6

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