

APPLYING THE PRESSURE

Can therapeutic compression be achieved in the home care setting?

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Abstract

- The (recognized) gold standard treatment for the patient with venous leg ulcers is graduated compression therapy, which is defined as 30mm/hg - 40 mm/hg compression at the gaiter aspect of the lower extremity. The home health care nurse is the clinician responsible for the application of the graduated compression therapy in the home health care setting. The goal of this study was to assess the home health nurse's ability to obtain accurate therapeutic compression to the standardized (same) patient.
- Piezoelectric, compression measuring device was selected for this study and consisted of the conductive thread sleeve with sensor to measure the mm/hg therapy applied to the ankle of a standardized patient. Thirty nurses of various years of experience both RN and LPN level applied four different types of compression. The formulary 2 layer wrap, the formulary 4 layer wrap, a combination sleeve with an edema reactive wrap and a compression garment were used in this study. Each nurse using the same leg model were given no instructions other than to perform the application as if they were in the Home Health Care setting. The screen of the reader was not visible to the nurses and no performance evaluation was given.
- The results from this study found that therapeutic levels were inconsistently obtained by the nurse. The average pressure obtained for a 2-layer wrap was calculated at less than 24mm/hg. The 4 layer wrap had an average of 46mm/Hg but with wide variations. The edema reactive wrap averaged 29 mm/hg with the garment using a calibration tool measured 38mm/hg. Sixty percent (60%) of the nurses failed to achieve the prescribed levels. We did not find a correlation between the accuracy of application and the level of work experience in Home Health or the licensure of the participating nurses.

Background

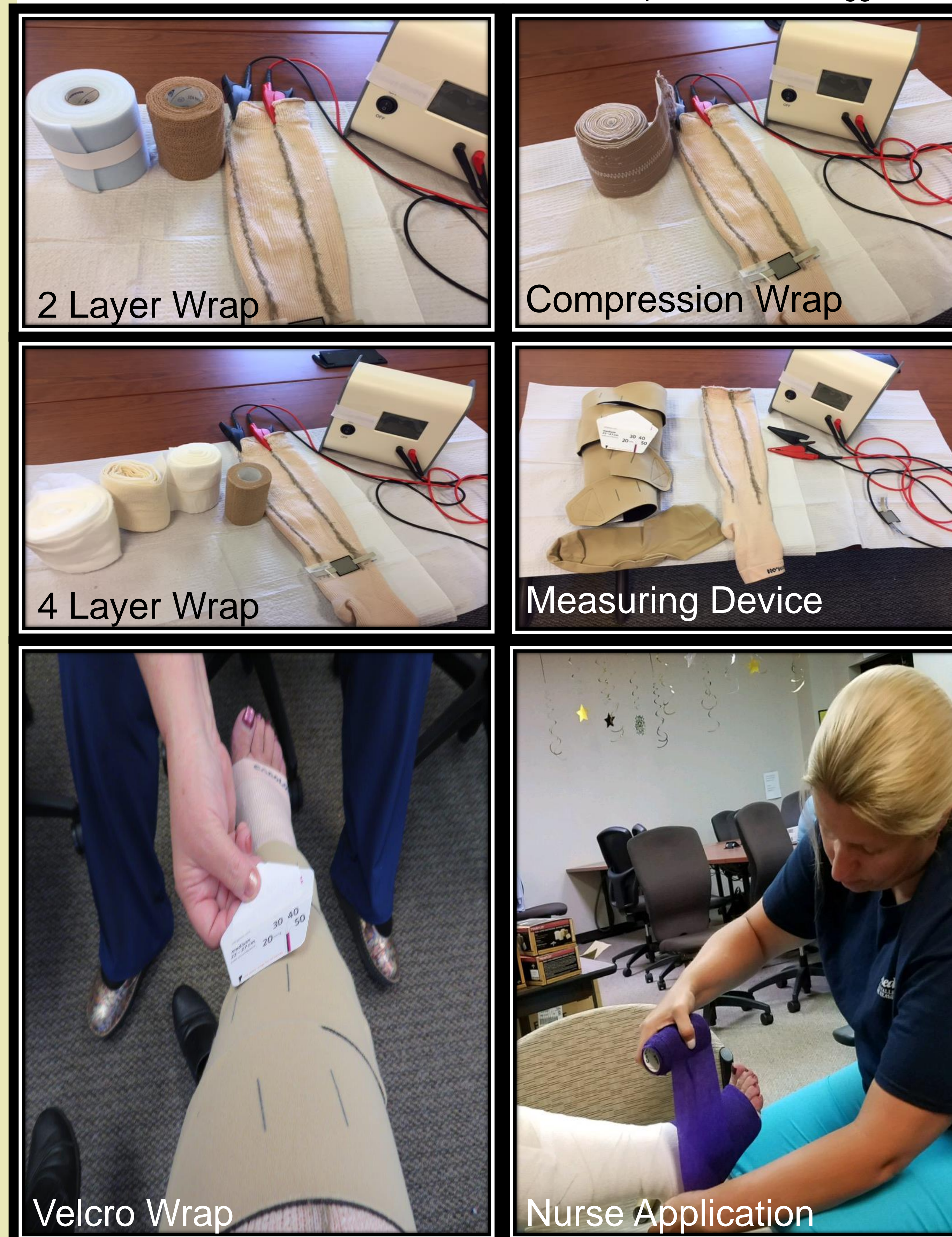
- Compression therapy is clinically proven effective by countering the effects of venous pressure, reducing edema and promoting wound healing. Graduated compression may be prolonged and the venous ulcer recurrence rate is high. Research regarding the prescribed compression application is limited.
- Home Health Care is delivered via physician order by the skilled clinician in the patient's home. The most current estimate by Centers for Medicare/Medicaid Services (CMS) is more than 2.4 million elderly and disabled are recipients of Home Health Care annually. Twenty-five percent of this demographic are patients with venous ulcers. The estimated cost of caring for these patients is approximately three billion dollars annually.
- While much attention has been given to the design of the compression wraps and garments, the accuracy of the application deserves more study. The data from this study revealed the nurses were not achieving the optimal prescribed compression and presented an opportunity to provide education for the clinicians. The inappropriate application of compression may result in adverse events, i.e. skin necrosis, ischemia, ineffective therapy and inadequate wound healing. The clinician with the understanding and skill to apply therapeutic compression is essential to achieving the positive outcome of patient wound healing.
- Our goal was to investigate how often the therapeutic compression was obtained by the Home Health nurse. The deliverance of therapeutic compression reduces the overall cost of care by decreasing skilled nursing visits, patient episodes and cost of supplies.

Objectives

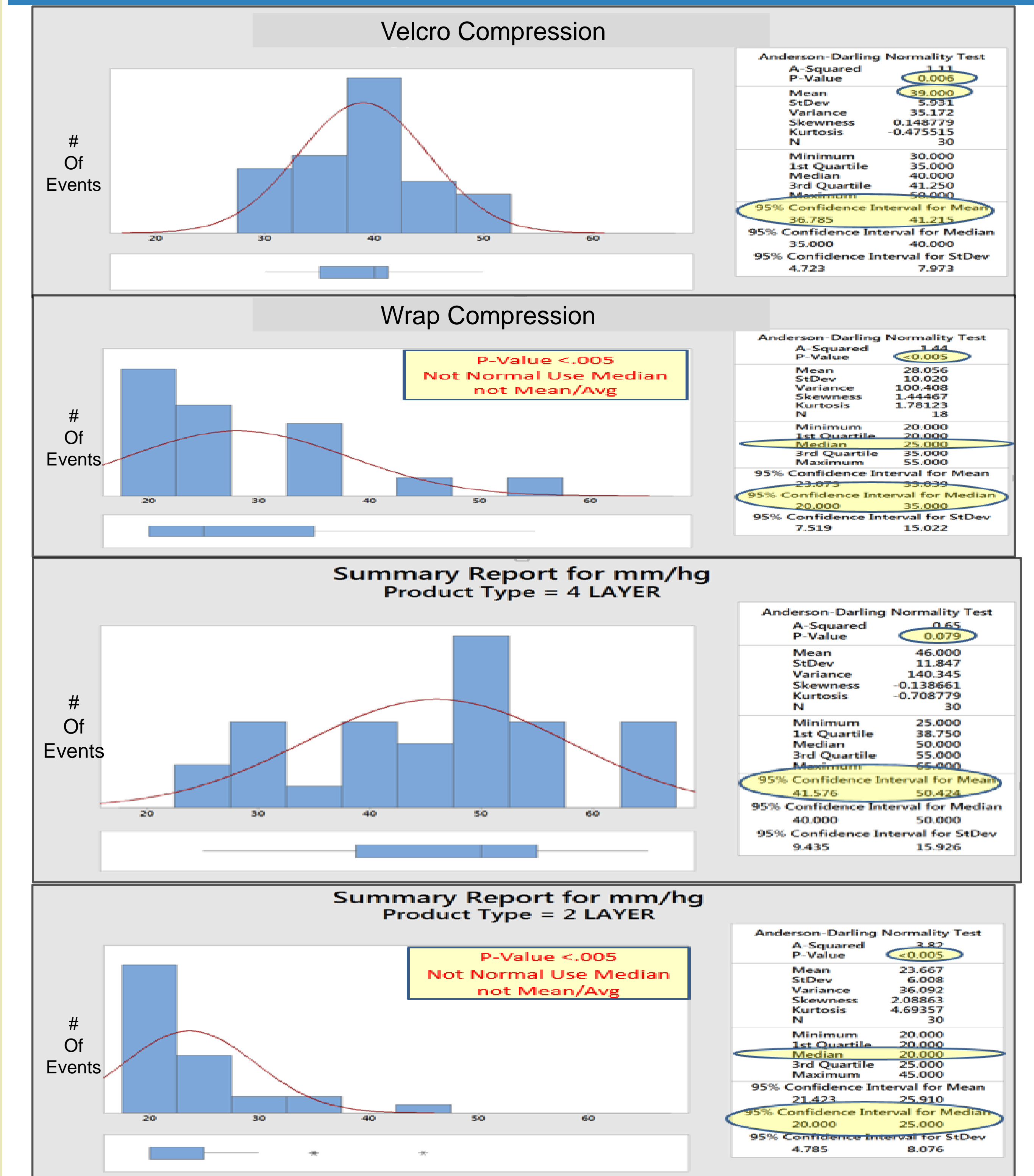
- Objective 1: To assess the home health nurse's ability to achieve adequate subbandage pressure applying therapeutic compression.
- Objective 2: To determine factors that may predict performance such as , licensure or years of experience.

Methods

- This study consisted of thirty nurses from four separate Home Health Care offices, volunteering to participate in the application of graduated compression wraps and a calibrated compression garment to one standardized patient.
- The Piezoelectric measurement device consist of a sleeve with a woven conductive thread, a sensor, applied to the sleeve at the patient's ankle and the Piezoelectric probe attached to the top of the sleeve over the conductive thread.
- The Piezoelectric measurement device measures pressure from 20mm/Hg to >65mm/Hg. The conductive leads attached to the meter, the meter screen was not visible to the nurse placing the graduated compression.
- Each nurse applied a 2 layer wrap, 4 layer wrap, an edema reactive wrap and a compression garment with calibration device.
- Additional instructions on application were not given to the nurse. The nurse applied the compression wrap to the standardized patient.
- The measurement of graduated pressure at the ankle, the nurse's name, the nurse credentials, and the nurse's level of experience were logged.



Results



Results

- The average pressure obtained for a two layer wrap was calculated at less than 24 mm/hg and was deemed non conclusive.
- The boxed 4 layer compression resulted in a mean compression of 46mm/hg which is outside of the therapeutic range for the venous insufficient patient. Only 9 participants achieved pressures between 30 and 40 mm/hg while 17 had pressures above the threshold of 40mm/hg. The nurses frequently asked for help in applying the 3rd layer. This raises the potential of adverse consequences.
- The combination sleeve and edema reactive wrap achieved pressures between 20 and 55 with the mean pressure of 30. The nurses had difficulty holding the elastic wrap and often dropped it while trying to wrap the leg which could have impacted the measurements.
- The compression garment with Velcro closures resulted in an average compression of 38mm/hg. 6 participants scored above the 40 threshold but no one scored below 30. Once a general explanation of the card reader was given, the nurses were able to use without difficulty

Conclusions

- The study demonstrated the challenge of the home health nurse to achieve the desired therapeutic compression for the patient.
- As evidenced from the study, an opportunity exists for additional education and training to ensure therapeutic levels are being obtained.
- The use of a measuring tool with the Velcro garment achieved the most consistent therapeutic compression with minimal education for the clinician.
- No correlation was found between application and other factors.