Compression therapy is an integral part of the treatment of venous stasis ulcers, wounds with an edematous component, and for treating limb lymphedema. Sub-bandage pressures above or below an optimal range are detrimental to achieving the goal of edema reduction. Most agree that compression application should achieve pressures between 30 to 40 mmHg with a therapeutic pressure gradient from distal to proximal portions of the limb. Deviations from such a therapeutic strategy may not only hinder progress but can be responsible for tissue damage and/or impairment of circulation. In clinical settings there are no readily available means of determining whether therapeutic pressures have been achieved or exceeded. We must rely upon the training and expertise of the therapist. A sub-bandage feedback monitoring system would enable therapists to perfect their technique in achieving the required pressures levels and a therapeutic gradient. In addition the feedback system would likely prove beneficial as a learning tool for students learning compression therapy techniques. Our goal was to determine if feedback, in the form of monitored sub-bandage pressures during lower extremity compression bandaging would help to teach or optimize sub-bandage pressures achieved.

**METHODS**

This was a quasi-experimental study with a one-group pretest/posttest design. Four experienced lymphedema therapists who regularly use compression bandaging in their treatment for lymphedema were instructed to bandage the lower leg of a single test subject using short stretch bandages to achieve a gaiter pressure of 40mmHg and a therapeutic pressure gradient. They were instructed to use a standard spiral bandaging technique. Bandages consisted of an initial layer of polyester padding to prevent excessive pressure over bony areas. Subsequent layers consisted of various widths (8 cm, 10 cm and 12 cm) short stretch bandages. Sub-bandage pressures were monitored with thin resistive sensors linked to a calibrated digital readout device (BANDPress® Bioscience Research Institute, Ft. Lauderdale FL). The sensors were placed at 10 and 20 cm from the lateral malleolus which were designated as gaiter and mid-calf locations respectively. Each therapist was given a total of six trials with each trial separated by 30 minutes. During the first three trials no feedback was offered to the therapist regarding the pressures they had achieved. Prior to starting the next three trials they were informed of the results for their previous trials and feedback information as to pressures achieved was provided immediately after each subsequent trial.

**RESULTS**

During the first three trials, these experienced therapists missed their targets with average pressures at gaiter and mid-calf of 51.9 and 60.5 mmHg respectively. However, for trials that followed feedback, the corresponding average pressures achieved were 38.8 and 27.5 mmHg. See figures 7 & 8.

**CONCLUSIONS**

Our goal was to determine if feedback, in the form of monitored sub-bandage pressures during lower extremity compression bandaging, would help to teach or optimize sub-bandage pressures achieved. Physicians, medical providers and medical compression instructors need to have assurance that compression bandages are being applied in a pressure specific, graduated manner and that therapeutic levels are being achieved and not exceeded. Bandaging requires a well-trained experienced therapist who can adjust tension, layers, and padding to the individual patient. Training using this form of sub-bandage monitoring pressure optimizes the sub-bandage pressures achieved during compression bandaging.

**REFERENCES**