

# Compression Modalities

The purpose of compression therapy is to control the edema and aid the return of venous blood to the heart. Compression therapy improves the efficiency of the calf pump, enhances valve function, reverses the capillary leak, and reduces the pressure differential. This is achieved by applying sustained graduated external pressure to the affected lower extremity.

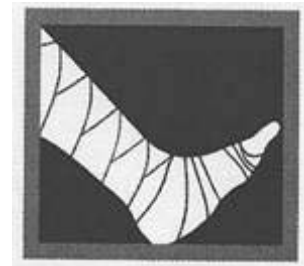
## How does compression work?

A compression bandage applies pressure to the leg, with greater pressure near the ankle and reduced pressure higher up.

This forces the blood to keep circulating away from the lower leg. When the blood stops pooling in the lower legs, the swelling goes down.

**Indications:** Lower Extremity Venous Disease  
Venous Stasis Ulcers

**Contraindications:** Infection  
Cellulitis  
Ankle Brachial Index (ABI) < 0.5 – NEVER  
De-compensated CHF



## How Much Compression:

Compression wraps are measured in millimeters of mercury (mm Hg) based on the amount of compression applied under the bandage at the ankle.

- Superficial or early varices 14 –17 mm Hg (Low) ABI score 0.6- 0.8
- Varices of medium severity, ulcer treatment and prevention of mild edema: 18 – 24 mm Hg (Modified Low) ABI score 0.6 – 0.8
- Gross varices, post thrombotic syndrome, ulcer treatment and prevention: 25 – 35 mm Hg (High) ABI score 0.8 – 1.0

## Factors that effect compression

The degree of compression produced by any bandage system is determined by interactions between four principle factors

- Physical structure and electrometric properties of the bandage
  - *Short stretch* - Non-elastic works on the principle of applying a low amount of pressure when the muscle is resting / not active. When the muscle is active, such as the calf muscle when walking, the short stretch bandage applies resistance to the muscle, also known as working pressure. A short-stretch system will not exert pressure at rest but only with muscle contraction. The pressure comes from within against a fixed resistance.
  - *Long stretch* - Elastic - high resting pressure and low working pressure. Bandage stretches with movement. Almost no change of tissue pressure noted with movement. Feels tighter at rest.
- Size and shape of the limb to which it is applied
- Skill and technique of the bandager
- Nature of any physical activity undertaken by the patient

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## KEY POINTS to Compression Wrapping

Sub-bandage pressure increases:

- More Layers are added
- Tension on the bandage is increased

Sub-bandage pressure decreases:

- The leg circumference gets bigger
- The bandage gets wider

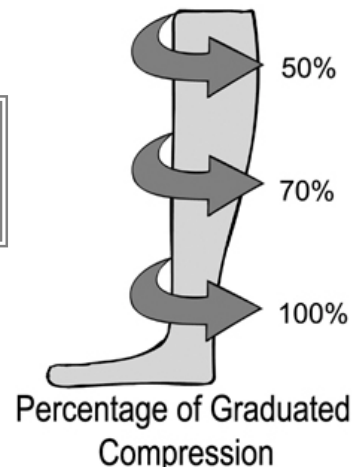
## Compression Wrap Tips

- Perform Ankle brachial index test, at a minimum, prior to application or recommendation of compression therapy.
- Apply enough tension to minimize wrinkling being careful to not overstretch the bandage.
- Apply first thing in AM.
- Bandage with foot dorsi-flexed.
- Start at base of toes and include heel.
- Always assess associated pain from bandaging.
- Wrap from lateral to medial for accurate compression.
- The wrap should extend to 1" below the knee.
- Upon reaching the knee do not wrap down the leg with any remaining bandage. If another application of the wrap is desired cut the bandage and begin reapplying from the base of the toes moving up the leg as before. The rationale is to avoid overpressurization of the calf area with the additional wrap, thus promoting venous return toward the foot versus the heart.
- If a 4" wrap is used, it will generally take two turns to secure the wrap to the foot using a 75% overlap.

The current review of the evidence suggests the following recommendations concerning compression therapy.<sup>1</sup>

- Compression is more effective at healing venous ulceration than no compression
- High compression is more effective than low compression
- Multi-layered systems, including elastic and inelastic bandages, appear more effective than single layer systems in healing venous ulceration

Gradient compression delivers a squeezing to the leg that is tightest at the ankle. The degree of squeezing or compression gradually decreases up the leg.



<sup>1</sup> Fletcher, A., Cullum, N., Sheldon, T.A. (1997) 'A systematic review of compression treatment for venous leg ulcers.' BMJ 315 (7108): 576-80.