Compression Wrapping- Basic to Complex

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Disclosure

Relevant Financial Relationships
None

Off-Label/Investigational Uses
None
Learning Objectives

• Participants will be able to:
  • Explain the benefits of compression bandaging for limb reduction.
  • Describe foam used for distributing pressure and foam used for fibrolysis.
  • Assess a limb for appropriate foam application.
  • Customize foam appropriately for either fibrolysis or reshaping of a limb.
Learning Objectives-

• Participants will be able to
  • Design compression for difficult body contours.
  • Fabricate basic compression for treating scrotal edema.
Wrapping is the best way to reduce a limb and improve tissue texture.

Compression wrapping = Offense
Compression garments = Defense
Wraps vs. Garments

**Wraps**

- Custom fit every time, will shrink with the limb
- Difficult to function while wrapped
- Often unable to wear shoes
- More gentle to skin
- Effectively improves tissue flexibility and decreases fibrosis

**Compression Socks**

- Final size is the final size
- Able to move around during the day
- Shoes can be important for decreased pedal edema
- Donning can cause trauma to fragile skin
- No ability to soften fibrotic tissue
Velcro Closure Devices

Velcro Closure Garments

• “Offense” and “Defense”
• Closer to a custom fit, will shrink with the limb
• Shoes can be used as foot compression (except while in bed)
• Donning does not cause excessive trauma to the skin however some padding can be used if extra protection required
• Useful in situations where the patient requires independence

Foam

• Foam can be placed under these type of garments to help protect skin
• Bandaging allows for better conformity with the skin however Velcro closer garments are an easy option for many patients
The Physics of Wrapping

- Pressure applied is inversely proportional to the radius of the limb segment bandaged.
- The greater the layers, the greater the pressure.
- The more narrow the wrap, the greater the pressure.
- Pressure is applied uniformly to a cylindrical object, but not an oval.
- Wraps on the hand and across the foot will apply greater pressure to the edges (non-cylindrical body parts).
Type of Bandage

Short Stretch

- ________, ____________
- Low resting pressure
- High working pressure
- Pressure determined by layers
- Decreased friction
- Will fall down when limb reduces
- Best used with an active muscle pump

Long Stretch

- ________ wrap
- High resting pressure
- Inadequate working pressure
- Pressure determined by tension
- Will tighten specifically on narrow places
- Used when no muscle pump present
Short Stretch
Long Stretch
Purpose of Padding

• Allows some “give” for muscle contraction
• Foam can distribute pressure evenly- foam rolls, cotton rolls, cut open-pore foam
• Foam pieces can mold limb contours- dense, closed-pore foam cut to fit
• Foam can soften fibrotic tissue- variety of foam densities cut into blocks and formed into packs and pads
Types of Padding: Pressure distribution

Soft Rolls

Soft Foam - Can Customize
Soft Foam- sheets or cubes
Closed-Pore foam: Molding and Remodeling
Combine textures to increase tissue compliance:

- Smaller cubes = less aggressive
- Open-pore foam = less aggressive
- Closed-pore foam = aggressive
Pre-cut bags of foam
Cover-Roll Stretch
Customize cube size, foam type and shape based on treatment goal:
Edges of large orange cubes can be too aggressive:
Pre-treatment
Post-treatment
Padding for the “everyday” limb:

• To pad boney prominences
• Padding decreases the incidence of tissue incidence significantly
• Now a part of the procedural guideline
• Padding rolls used for this purpose, never fibrolytic foam techniques
Dorsum of Foot

Malleolus

Tibial Crest
Anterior Tibial Tendon

Achilles Tendon
Padding Tips

• A bit of muscle contraction will assist in properly applying the correct amount of pressure
• A light layer followed by a tight layer is always more comfortable
• If you layer with a final tight layer, the patient can always “escape”
• If your patient isn’t sure if the bandage is comfortable, have them move actively; if no improvements, re-do!
Special Instructions for Arterial Insufficiency

• Compression while supine (at night) is not appropriate

• Compression must be applied gently

• Pain indicates compression is too aggressive or that the wraps/device/compression sock needs to be removed

• Assess compression with capillary re-fill test
Low stretch wrapping is an important part of a maintenance program.

Wrapping is often continued strategically while the garment is used most days.
Goals for Treatment

- Do not make the solution worse than the problem.
- Attempt to find the most effective and least annoying combination for your patient.
Scrotal Edema
Scrotal Edema

• Plan A: Elevation
• Plan B: Underwear or spandex
• Plan C: Artiflex or ABD pad under __________ (no need to tuck or create a “pouch”)
• Plan C (second try): Padding with _________
• Plan D: Modified athletic supporter
• Plan D (second try): ________/__________ under spandex shorts
Treatment for the Inpatient: Elevation

• Use a folded pillowcase

• Middle of the pillowcase under the center of the scrotum with the edges between the thighs and the fragile skin of the scrotum

• Lift this “sling” and place two or so rolled towels under the scrotum

• The pillowcase has a softer texture than the towels which should be more comfortable

• The patient can hold onto the ends of the pillowcase to hold the scrotum out of the way when getting to the edge of bed
Underwear

• Either ‘tightie-whities” or ___________ compressive underwear
• Using the own patient’s clothes are the best
• Very little compression is required to provide meaningful reduction in scrotal edema
Se-Pro-Net or Band-Net

• Cover the scrotum with artiflex padding or an ABD pad, then cover with the ____________

• Size 7 or 8 for scrotal edema, size 2 or 3 for penile edema. However if the scrotal edema overwhelms the penile edema, they can be compressed together in size 7 or 8

• ____________ available from therapy is much tighter than the _______________ (see: Plan C second try)
Modified Athletic Supporter

• The following slides demonstrate how an athletic supporter can be modified to accommodate a larger abdominal circumference

• This works if the scrotal edema is not too extreme and if the patient is quite mobile
Abdominal Edema
Assessing Motivation

- Motivation makes or breaks treatment plan
- If you, the treating therapist, are the only cheerleader of a marginally motivated patient, you will fail
- Creativity and time crucial- the trial and error process can take up to 1-3 hours per day for fabricating compression garments or attempting alternate ways to wrap
Sample Treatment Plan

• Reduce the “easy” edema first with compression to the knees only.

• Attempt to find Capri-type compression to test the ability of the patient to tolerate compression on the thighs and abdomen.

• Experiment with thigh compression

• Don’t be afraid “break the rules” – example: high stretch wraps, wrapping proximal to distal, leaving out ankle or knees
Currently available on the market
Important considerations

1. What effect does mobilizing massive amounts of abdominal edema have on the other major organ systems, in particular the respiratory system?

2. How is the skeletal system affected by attempts to suspend a pannus?

3. Are patients capable of problem solving on their own? Can they carry out a home program minus the supportive environment?
Case Studies