Compression Garments – Why Bother?

Prevention

Maintenance of current limb volume

Healthier cell environment – faster nutrition in, waste out. Slowed fluid exchange => altered cell functions, and stagnant environment ideal for bacterial party! (increased risk of opportunistic infection can further scar delicate lymphatics)

Reduces risk of progressive swelling, hardness
Why Bother?

Provides measure of skin protection against various trauma

Minimizes future complications when combined with other risk reduction practices

Initial diligence and ongoing persistence => payoff of “garment free pass” for “special occasions”

Gives YOU control over your LE
NIH & NNMC STUDY 2001-2006

Followed n=196 newly dx BCRA pts

Prior to surgery, then 3 mth intervals following surgery up to one year. Ave onset 6.9mths after surgery.

Perometry identified sub-clinical LE in 43 pts (83ml or 3% volume change)

Treated with ready made sleeve and gauntlet. Results within 4.4 wks, volume reduced ave of 48ml, ie ~50%. (almost to size of unaffected arm). Results maintained at 4.8mth follow-up

Early intervention at this stage when LE is reversible, (lymph stasis is more fluid like rather than more viscous, no dermal changes)
LE likely starts in subfascial layers, and by time lymphatic reflux affects skin lymphatics (in superficial fascia), LE well on way to Stage II, a less reversible stage which does not respond as quickly to simple sleeve compression.

Also noted - One of highest risk factors for developing LE is obesity. This may prevent some patients from using ready made garments because it is imperative that the sleeve fits the limb appropriately.
Effective Compression should...

**Reduce the ultrafiltration rate** – limit excessive arteriole outflow into the tissue spaces, which means less fluid for lymphatics to remove. Prevents re-accumulation of evacuated fluid by preventing re-expansion of tissues.

**Enhance efficiency of muscle/joint pump** – provide a resistance barrier against muscle contraction, forcing more fluid into venous and lymphatic systems. Wear garment during resistive exercise (increase fluid removal) and after exercise (maintain reduction).
Effective Compression should...

Help restore valvular function in deeper lymphatics and venous vessels (by bringing flaps into closer proximity and thereby reducing backflow)

Maintain/restore glide in superficial fascia => important in slowing and reversing the proliferation of skin and connective tissue changes (fibrosis, sclerosis, hypertrophic scars)
Effective Lymphedema Garments

(Great, Chocolate Fudge For Dinner!)

- **GRADUATED** – designed to apply greatest pressure distally eg foot, decreasing proximally eg thigh

- **Appropriate Compression CLASS** –
  - Too low will not prevent the limb from re-filling
  - Too high will constrict blood and nerve supply, causing discomfort

- **Appropriate FABRIC Construction for STAGE of LE** (Round vs Flat knit)

- **FIT WELL**

- **WORN DAILY**
Compression Classes (mmHg)

Measured in millimetres of mercury (mmHg)

Refers to amount of pressure exerted by the garment at its most distal end, eg ankle or wrist

with decreasing pressure proximally eg top of leg or arm
No international standardisation of classes. Varies within and between manufacturers. Varies between upper and lower limb.

<table>
<thead>
<tr>
<th>North American</th>
<th>European</th>
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<tbody>
<tr>
<td>Class I</td>
<td>Class I</td>
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<tr>
<td>20-30 mmHg</td>
<td>18-21mmHg</td>
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<td>Class II</td>
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<td>30-40 mmHg</td>
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<td>Class III</td>
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<td>40-50 mmHg</td>
<td>34-46mmHg</td>
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<td>Class IV</td>
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<td>50-60 mmHg</td>
<td>49-70mmHg</td>
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Choice of Class for LE Dependent on:

Stage of LE; sub-clinical, mild, moderate, severe
Patient age, lifestyle, limb volume, tissue hardness, muscle tone, co-morbidities (eg COPD, diabetes), mobility, assistance at home to don/doff garment if needed.

General rule of thumb:
Class I and II for upper extremity
Classes I-V for lower extremity. Lower extremity ABPI important especially if wound present
Type of fabric construction important to long term management of LE

ROUND KNIT (Ready made) – indicated for subclinical and very mild edema, no fibrosis and no increased fatty deposition in superficial fascia and skin. Normal anatomical limb shape.

FLAT KNIT – indicated for moderate to severe edema; possible loss of polyhedral texture of skin, and/or fibrosis, and/or fatty changes in SF. Stiffer fabric grips skin => shearing force on SF beneficial to restoring glide, reducing fibrosis and sclerosis. Absolutely necessary for late Stage II, Stage III LE, where limb shape often distorted and skin folds present.
Round Knit Garments

Come in pre-set sizes - aim to get the closest match to the patient's actual measurements

Pros - generally less expensive, come in greater variety of colours, easier to don and doff in class I and II, lighter weight, quick line-drying, more esthetically pleasing

Cons - Tend to snag more easily, tendency to roll over on itself at top of garment especially if tissue is fleshy, tendency to strangulate
Flat Knit Garments

Knitted flat and joined by a seam
Allows custom fit to specific dimensions of patient without cutting into skin or deeper folds

Requires Garment Fitter to have specialized training in order to obtain good results for patient
Flat Knit

Pros:

Thicker fibres produce more stiff fabric and increased resistance for muscles to contract against => greater containment of edema. Firmer fabric provides better compression over larger areas, esp legs, large upper arm.

Wider fabric weave – gives increased micro massage to tissues, enhancing alternating tissue pressure, forcing more fluid into draining vessels, while gentle shearing forces exerted at the interface between fascial layers minimizes risk of secondary tissue changes and helps soften them if present.
Flat Knit cont...

Pros:
Pockets can be sewn into a flat knitted garment, with padding inserted into these to further target specific hardened tissues

Cons:
Often quite a bit more expensive but not always
Sometimes harder to don than ready made
Some brands have more limited colour choice
Need overnight or a little longer to dry, depending on the brand. Some are dryer approved, others not.
What constitutes a well-fitting garment?

Feels **relatively comfortable, snug** and supportive to limb

Correct **length** – fully covers length of limb – does not fall short at either end, **no gaps** between two pieces required to manage limb swelling eg glove & sleeve

Correct **circumferences** – not too loose, or too tight, especially at areas of overlap eg wrist. No sausage-like swelling beyond where garment ends, eg fingers/toes

**Overlaps** – must be sufficient to avoid gaps when limb is moved ie need between 4-6cm at wrist, 10-12 cm lower limb
Garment style is another consideration...

What is the minimal area we need to compress in order to get fluid into a quadrant which has normal lymph/venous collecting capacity?

Does the edema stop at the knee, the thigh, the abdomen/buttocks?

Are the legs very conical in shape (knee high and capri will stay up better than thigh highs alone)

Or are the legs more uniform and pillar like? Thigh high often sufficient

If edema is confined to groin and top of thigh, then perhaps bicycle short style is sufficient
Layering of Compression Garments

When higher compression is required, it is sometimes easier to don and doff two layers of garment, each of a lower class.

Useful esp in lower limb, when patient has decreased grip strength eg knee high + capri pantyhose (Fitter must allow for decreased compression over areas of overlap).

Doubling classes does NOT double the effective compression, rather gives approx 1½ times of combined classes eg Cl 2+2=3!
Layering of Compression Garments

Can target distal swelling where compression is most needed by increasing stiffness factor, resulting in greater resistance and better containment. eg Cl 3 thigh high with Cl 2 knee high over top

But ALWAYS, must have greatest combined pressure distally, decreasing proximally

Works better with FLAT KNIT than round knit; less tendency to strangulate
Signs a garment is not fitting well...

Pain, or altered sensation (tingling, numbness)

Disturbed circulation (blue, purple, white, cold fingers/toes)

Binding anywhere along its length

Cutting into creases, eg knee, elbow

Long lasting indentations when removed

Bulging at either end of where the garment finishes, ie wrist/top of arm, foot/top of thigh

Slips down the limb when active (use either silicone band or water based glue)
When to get fitted is dependent on a number of things...

Better to get measured in morning when edema is usually less

Ideally limbs are maximally decongested of excess fluid

However, most people do not fit in this category, so are fitted when they have plateaued, or want to manage the current state of edema while not expecting it to reduce significantly

If bandaging, must continue to bandage until garment arrives
When you start wearing a new garment

Begin gradually, 1-2 hrs per day and build up wearing time over first 10 days, when your aim is to wear it during waking hours (or as long as possible)

If initially, skin redness or irritation develops (esp crease of elbow, knee), be careful of skin breakdown. Try thick ointment/vaseline over area temporarily (but don't use longterm because it can damage garment fabric)

Or, try a piece of silk, or “second skin dressing”

If skin irritation persists, check back with fitter
When you first get your garment

Initially if it feels like fluid is pooling in hand or foot, this should be relieved by slow, gentle movement of the limb. If it persists after a few days, return to fitter for re-assessment of garment. (Ideally get hand piece + sleeve for 1st garment – minimizes risk of fluid being forced into hand. If hand stabilizes, then may not need coverage next renewal)

Never turn the end of the garment over on itself at either end eg foot or top of thigh. Will cause double compression in this area and make swelling worse. If it is too long, return to your fitter
How long will the garment last?

Replace at minimum, every 6 months of daily wear, sooner if very physically active and hard on the garment. Effective support becomes diminished as fibres lose their elasticity => decreased fluid exchange, tissues become more compromised, and can result in more edema + hardening of the limb. Where feasible, have two garments simultaneously, so that one can be washed while the other is being worn.

Lotions will shorten garment life. Moisturise in the evening after the garment has been removed.
KEEP IN MIND...

Weight gain or loss will affect how your garment fits.
Get re-measured each time you order new garments, even if you think the old ones still fit. Subtle changes can reflect deterioration or improvement over time.

Some fabrics wear better than others.
Darker fabrics don't get grubby as fast.
Active Infection

Stop wearing garment until antibiotics have been started and pain in limb has decreased sufficiently to allow garment to be donned again.

Remember that after infection, there is often residual swelling and hardness for some weeks. Greatly helped by wearing garment combined with exercise, especially aqua therapy – either swimming or aquasize.

If repeated infections occur, be proactive about treatment, exercise and wear flat knit custom garment.
Compression at night

DO NOT wear a compression garment designed for daytime use at night, unless it is specifically designed for both uses.

Day use garment design is such that the elastic fibres want to re-coil. Muscle activity helps disburse this innate tension. Lack of activity at night can result in fluid stasis at a point distal to natural flexion creases eg wrist, elbow, ankle, knee.

Specific garments have been designed for use at night allowing for comfort, while enhancing fluid return and addressing fibrosis softening.
Garment Laundering

Follow manufacturers instructions to protect warranty

Launder daily or every second day – restores elasticity, removes body oils and cream residues which break down fibres

Can be washed by hand, or in laundry bag in machine

Do not use wool detergents or softener – coats fibres, causing garment to slip down

Silicone band – once per week, wipe down with vinegar to remove residue buildup
Medical Coverage

Pharmacare - NO coverage for leg garments

Need for lobbying – medical necessity, not cosmetic!

Coverage for upper limb garments following post-mastectomy/lumpectomy treatment

http://www.health.gov.bc.ca/pharmacare/medsup.html

Coverage for upper and lower limbs may be possible through Extended Health Care Plans, or claimed as a medical expense on income tax.
What Pharmacare may cover depending on your deductible

1 breast prostheses per mastectomy every 2 yrs; maximum $350 each

1 breast prostheses per lumpectomy every 2 yrs; maximum $300 each

2 sleeves per year, per mastectomy. No limit stated.

2 gloves/gauntlets per year, per mastectomy; maximum $300 each for custom-fitted products, $150 for off-the-shelf products

two post-mastectomy brassieres per mastectomy or lumpectomy if purchased within six months after surgery
Carol Armstrong BA RMT
carmstrongrmt@telus.net

- Practicing MLD and massage since 1993
- Medical Garment Fitting since 2004
- Located in Fairfield, Victoria BC
- Tel : 250 598 8004
- Fax: 250 598 8044