

Key Medical Compression Garment Considerations for Self-Care/Maintenance



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Brief Overview of Compression Therapy

- Origins trace back to ancient civilizations such as ancient Egypt/Greece! 
- **19th century** saw development of more **structured, elastic garments** with better support
- **20th century** saw major advancements in **textile technology & medical knowledge**
- **1950's: Conrad J.**, an engineer, is recognized as the inventor of **medical-grade, graduated Compression garments (MCG's)**
- **Graduated Compression:** the compression is **stronger distally** (ankle or wrist) and **gradually decreases up the leg or arm**, helping push lymph fluid /blood back towards heart.
- Today: **MCG's** are available in various styles, sizes, shapes, elasticity, & strengths, tailored to fit medial/therapeutic purposes, patient needs, and all body parts



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Importance/Benefits of Medical Grade Compression Garments (MCG's)



- Positive impact of MCG use is evident throughout the literature
- **MCG's** are a primary mode of lymphedema self-care & self sufficiency
- **Medical Conditions Treated/Indications:**
 - Lymphedema, Phlebolymphe^dema & Lipedema
 - Chronic Venous Insufficiency
 - Venous Ulcers
 - Post Surgical recovery
 - Sports and Injury recovery
 - Prophylaxis



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Key Mechanisms of Action: *How Compression Assists in Treatment/Management*

- Involves the application of external pressure to a body part to aid in the reduction of swelling & improvement of venous circulation
- **Reduced Edema:** By improving lymphatic drainage and reducing capillary filtration (leakage) into tissues
- **Enhanced Microcirculation:** Improves oxygen and nutrient delivery to tissues
- **Improved Venous Return & Decreased Venous Pressure**
- Plays a key role in **maintaining results achieved with CDT** (Complete Decongestive Therapy)



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Mechanisms of Action: *Trophic Changes and Clinical Symptoms*

- **Reduced inflammatory response** by release of anti-inflammatory mediators (small molecules and proteins)
- **Resolution of fibrotic tissue** producing a softening of skin.
- **Reduced pro-inflammatory cytokines** resulting in an anti-inflammatory effect, **reducing pain, & promoting wound healing.**
- **Reduced edema** allows for normal shoe wear and participation in normal Activities of Daily Living (AoDL), **improving QOL.**
- **Optimized therapeutic benefit of a compression garment is achieved when patients exercise and move while wearing their garments**

• Bjork R, Ehmann S. S.T.R.I.D.E. Professional guide to compression garment selection for the lower extremity. Journal of Wound Care 2019; 28:(6suppl1) 1-44.



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Types of Medical Grade Compression Garments for Lymphedema

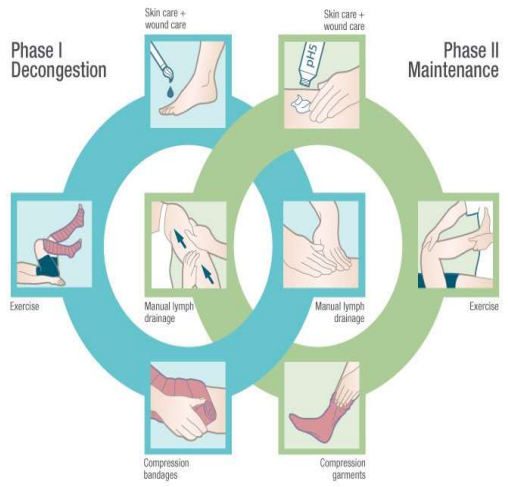
- **Short Stretch** Compression Bandages “Decongestive garments”
- **Compression Garments**, stockings, sleeves, socks, shorts, toe-caps, gloves, etc.
- **Channeled Chip-Foam** Compression Garments
- **Adjustable Compression Wraps** (ACW’s). Can also be decongestive



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Intensive Phase Treatment: In-Clinic Care Review

- **Phase 1 Decongestion**
- Skin Care & Wound care
- Manual Lymph Drainage (MLD)
- Short stretch compression bandaging
- Remedial Exercises
- Patient Education



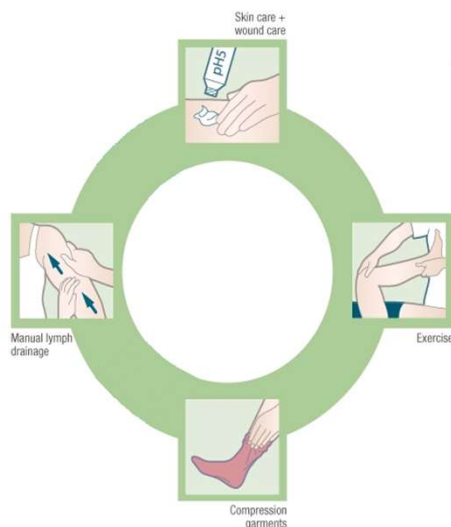
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Maintenance Phase II: At-Home Care or Self-Care

- Skin Care & Hygiene
- Self Massage/MLD
- Compression Garments
- Exercise (with garments on!)

Plus ↓

- Nutrition considerations
- Weight management
- Comp Bandaging if necessary
- Pumps: Intermittent Pneumatic Compression (IPC) Devices



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Compression Garments



- Can be custom fitted or ready-made (OTS) garments
- Usually worn after initial reduction phase to maintain reduced limb size and prevent fluid accumulation
- Usually meant for day-wear
- Garments are made for: neck, face, trunk, arm, hand, pelvis, genitals, legs & toes.
- **Circular Knit**
- **Flat Knit**



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Channeled Chipped-Foam Compression



- Custom fitted or ready-made
- Usually worn **after initial reduction phase to maintain reduced limb size**
- Used as **a night-time garment or bandage liner**
- Can be made for any body part, limb, face, chest, etc.
- **Helps soften superficial fibrosis**



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Adjustable Compression Wraps (AW's)



- Easier to don than compression garments
- Can be **used in both reduction and maintenance phases.**
- Safe for day and night wear



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Components of Medical Grade Comp. Garments (textile)

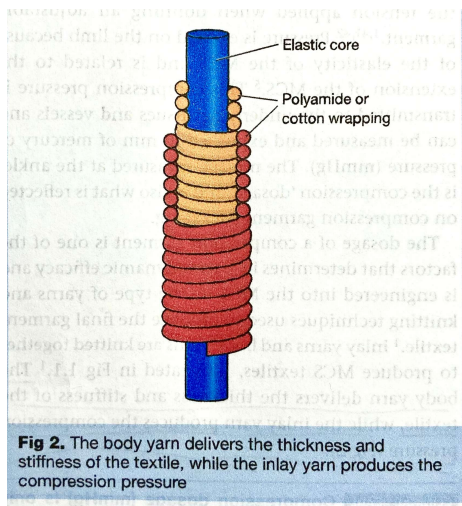


Fig 2. The body yarn delivers the thickness and stiffness of the textile, while the inlay yarn produces the compression pressure

- Breathable, moisture-wicking materials for extended use comfort
- Nylon, Elastane, Spandex, Silicone, Coolmax®, Acrylic and Cotton combos

• Knitting/weave methods divided into:

- **Circular Knit**
- **Flat Knit**
- **Cut-N-Sewn** (warped Knit)

- Each garment has its own unique advantages and disadvantages as it relates to an individual's edema presentation



Bjork R, Ehmann S. S.T.R.I.D.E. Professional guide to compression garment selection for the lower extremity. *Journal of Wound Care* 2019; 28(6suppl1) 1-44.



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Circular Knit: Weave & Textile Info

- Generally sheer, soft, stretchy, smooth, thin, & mass produced.
- Generally Ready-to-Wear (RTW)
- Knit is a tube-like shape and has a uniform stretch.
- Lacks in “Stiffness” and often rests in skin creases




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Flat Knit: Weave and Textile Info

- Stiffer than Circular knit
- Provides a higher level of containment
- Better at bridging skin folds
- Less likely to “cut-in” or create a tourniquet effect
- More precise, targeted compression levels



• Bjork R, Ehmann S. S.T.R.I.D.E. Professional guide to compression garment selection for the lower extremity. Journal of Wound Care 2019; 28:(6suppl1) 1-44-4.



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More Flat Knit Garments







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Cut-N-Sewn (warped-knit weave and textile)

- Durable fabric
- Precise gradient compression
- Suitable for unusually shaped dimensions
- Fabric varies in **stiffness**

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Flat Knit Circular Knit Cut-N-Sewn



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Adjustable Comp. Wraps (ACW) (weave /textile info)



- Fabric is usually “**stiffer**” than flat or circular knit
- Can be used for **fluctuating edema, reducing edema, and maintenance.**
- **Decongestive** garment
- Fabric can be completely inelastic or short stretch
- Textile used is often a form of **Velcro-sensitive neoprene**

Bjork R, Ehmann S. S.T.R.I.D.E. Professional guide to garment selection for the lower extremity. 2019; 28:(6suppl1) 1-44.



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Channeled Chip-Foam Garments

- Incorporated **textured materials** to **soften fibrotic tissue** and enhance dynamic compression effect
- **Polyester/cotton/spandex/Coolmax®**
- Usually worn at night
- **Purpose is to:**
 - **Prevent rebound swelling**
 - **Maintain volume reduction**
 - **Address soft tissue changes**



Bjork R, Ehmann S. S.T.R.I.D.E. Professional guide to compression garment selection for the lower extremity. Journal of Wound Care 2019; 28:(6suppl1) 1-44.



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Compression Levels: Strength - mmHg

- Different compression levels cater to various medical conditions
- **Strength**, or **Dosage** of the fabric pressure on the skin is **measured** in **mmHg**.
- **Strength** refers to the garment’s ability to provide the **intended level of compression over time** with usage.
- Quality, **well-made garments** hold their **Strength** over several months. **Lesser quality garments fatigue quickly** so have **less therapeutic value**
- Choosing a **“stiffer”** textile vs increasing the prescribed **“dosage” (strength)**, may have better outcomes for some patients.

• Bjork R, Ehmann S. S.T.R.I.D.E. Professional guide to compression garment selection for the lower extremity. Journal of Wound Care 2019; 28:(6suppl1) 1-44.



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Compression Levels: Class and mmHg

German Classification System

- Class I 18-21mmHg
- Class II 23-32mmHg
- Class III 34-46mmHg
- Class IV >49mmHg

US Classification System

- Class I 15-20mmHg
- Class II 20-30mmHg
- Class III 30-40mmHg
- Class IV 40-50mmHg
- >50mmHg



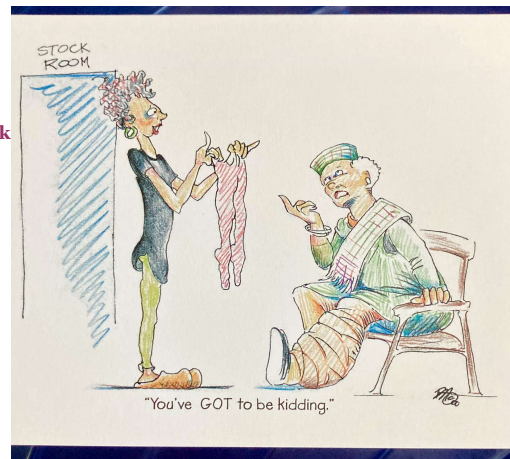
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Choosing the Right Garment

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- Many things must be considered
- Proper fitting is essential!
- Comp Garments need to be fit with the correct size, proper pressure, based upon the patient's condition, **severity of swelling** and physical ability.
- **Additional considerations include:** mobility, **ROM**, obesity, **hand dexterity**, patient's job, comorbidities, **pain**, age, **cognition**, finances, geography, & personal preferences

• Scheer R. Compression garments for managing lymphedema. Journal Of Lymphedema. 2017, Vol 12, No 1. 39-45



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S.T.R.I.D.E. Choosing the Right Garment

- **S.T.R.I.D.E.** is an acronym
- Each letter stands for a key group of **considerations** when selecting a comp. garment
- **S = SHAPE** of the limb
- **T = TEXTURE** of the edema, skin, soft tissues
- **R = REFILL** of edema during day, night and, how quickly
- **I = ISSUES** precautions, contraindications, etc.
- **D = DOSAGE** strength mmHg
- **E = ETIOLOGY** underlying diagnoses contributing to the oedema

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S.T.R.I.D.E. T=Texture: Tissue Descriptions

- **Watery** Stage I: soft pitting, easy to reduce, - Stemmer's
- **Fatty** Stages I-III: Healthy fat, lipedema SAT, lymphostatic fibrosis
- **Putty** Stages I-II: soft, pitting with prolonged pressure, early fibrosis, + Stemmer's
- **Woody** Stages II-III: hard, non-pitting, extensive fibrosis, + Stemmer's



- Bjork R, Ehmann S. S.T.R.I.D.E. Professional guide to compression garment selection for the lower extremity. Journal of Wound Care 2019; 28:(6suppl1) 1-44.



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Choosing the Right Garment: Considerations

- **Important to match tissue type to the appropriate textile characteristic !!**
- **Soft, pliable, watery tissue** is easily reduced and can be managed long term with **circular knit at lower mmHg**
- **Abnormal fatty tissue** may need stiffer, thicker textiles like flat knit to bridge across creases & help shape/support if tolerated
- **Fibrotic tissue** requires stiffer garments to provide adequate containment during day, & textured compression for night to soften fibrosis
- **Advanced fibrotic tissues "Woody"** require **day and night** compression, **stiffer textiles** and **higher mmHg pressures & textured comp. options** to soften fibrosis
- Adjustable Wraps with an underliner are a good choice for fragile skin and wounds
- Tissues with **rapid edema Refill** require **higher levels of containment & night** compression.
- Sheer circular knits are the most elastic, followed by opaque garments, and then those made by natural yarns such as cotton

- Bjork R, Ehmann S. S.T.R.I.D.E. Professional guide to compression garment selection for the lower extremity. Journal of Wound Care 2019; 28:(6suppl1) 1-44.



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Choosing the Right Garment: Considerations

- For **new users**, start with **lower compression levels** and **gradually increase** as tolerated
- **Extra wide bands, silicone bands, & adhesives reduce slippage and rolling.**
Yes, some slippage is normal!
- Must fit properly to be effective and comfortable
- Best to obtain comp. garments made by reputable companies that have robust, voluntary, internal quality controls.
- For RTW, shape/size of limb must match up with standardized sizing.
- Comp. garment(s) should encompass ALL areas of edema.
- **Golden Rule of comp. garment selection:** limb/body part **MUST** be in a **decongested state** (minimal to no edema), **PRIOR** to measuring & fitting

• Bjork R, Ehmann S. S.T.R.I.D.E. Professional guide to compression garment selection for the lower extremity. Journal of Wound Care 2019; 28:(6suppl1) 1-44.



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MCG Care & Maintenance Considerations

- MCG fabric and mmHg dosage is affected by: stretching, washing, body oils, sweat, sun, etc., causing garment fatigue.
- Recommend to **replace every 4-6 months** if worn daily and alternated with a 2nd set!
- MCG's will overstretch and roll if not washed every other day.
- **Best to have 2 garments to allow for cleaning and rotation.**
- Moisturizers with petroleum will reduce longevity of MCG's.
- **New custom garments are like a new pair of jeans. The fit will feel different than your previous "old" garment/jeans.**



Scheer R. Compression garments for managing lymphedema. Journal Of Lymphedema. 2017, Vol 12, No 1. 39-45



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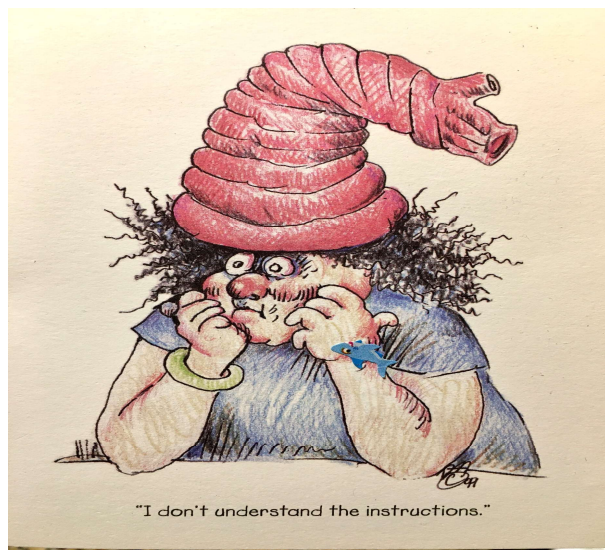
Some Key Precautions & Contraindication Considerations

- Conditions such as diabetes or arthritis can limit tolerance to compression
- **Persons with underlying health conditions should consult with their healthcare providers before using MCG's**
- Before MCG application, at a minimum, **blood clots (DVT) and Peripheral artery disease (PAD)** should be ruled out
- **Chronic Kidney Disease (CKD), Congestive Heart Failure (CHF), obesity, and other medical conditions must be considered**
- Fabric sensitivities/allergies
- Good skin hygiene and wash MCG's regularly
- Frequent inspection of skin under MCG for signs of irritation



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Patient Compliance and Application Tips



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Patient Compliance and Application Tips

- **Medical Comp Garments (MCG's) are a 2x daily, 7 days weekly commitment**
- Personal preference is crucial to patient adherence
- Apply MCG's while still in bed or ASAP after getting out of bed
- Wash/dry/apply lotion to affected areas at night vs morning
- MCG's are difficult to apply/don to moist skin
- **Leg Garment:** grasp MCG by heel pocket, turn inside out until heel is visible. Insert dry foot completely into MCG foot, easing garment onto foot/heel rather than pulling from top of MCG
- **Wash/wear new custom comp. garments 5x/5days to get actual fit**
- **Arm Sleeve:** turn MCG inside/out by 1/2 or 2/3, then insert dry hand/arm and ease onto forearm. Gradually pull the outer layer upwards, up and over elbow.
- Keep finger and toenails trimmed and filed.
- Use textured rubber gloves to help with grip on MCG
- Many donning/doffing assistive devices available

British Columbia Provincial Nursing Skin and Wound Committee, Guideline: Application of Compression Therapy to Manage Venous Insufficiency and Mixed Venous/Arterial Insufficiency. CLWIK.CA 2016: 1-13.



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Assistive Devices for Donning/Doffing



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Conclusion



- MCG Therapy is an effective & essential component of lymphedema self-care management and self sufficiency
- Important to consult healthcare professionals for guidance
- Success depends on correct application, appropriate type of compression, proper fitting, pt education & adherence.
- MCG's are most effective with movement/exercise!
- When used correctly, significantly improves pt outcomes, maintains reductions, reduces symptoms, and enhances QOL.



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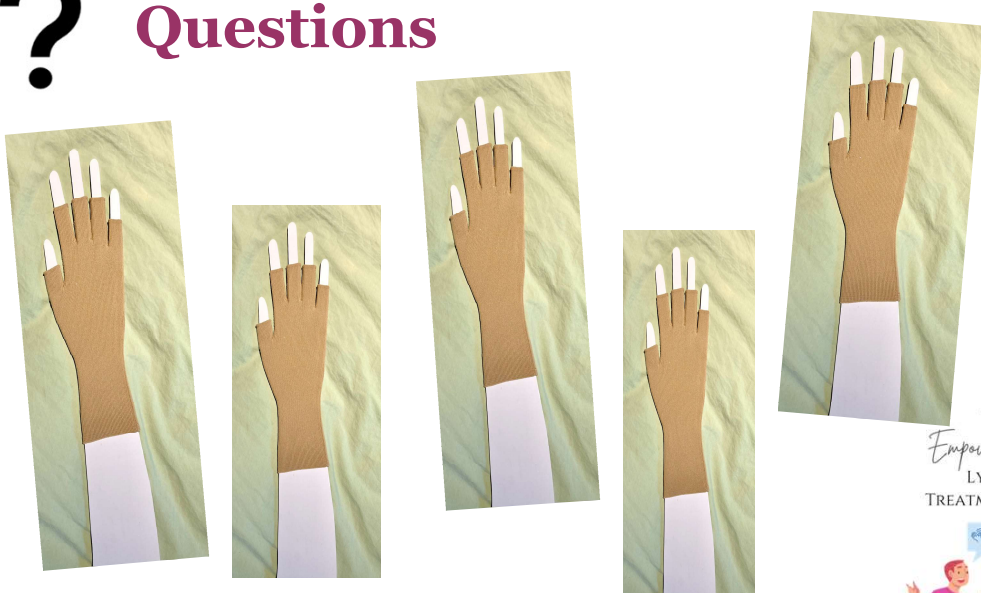
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? **Questions**



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