Risks And Contraindications Of Medical Compression Treatment
- A Critical Reappraisal: An International Consensus Statement.

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Disclosure
- Member of the International Consensus Statement Group
- Co-author of the Consensus Document
- Educative lectures - MEDI

65 year old patient
- lower limb foam sclerotherapy two weeks before hospital admission
- class II compression stocking prescribed after sclerotherapy
- initially no claudication (but no data about peripheral pulse reported!)

But we should be careful with proper compression application also in the patients without previous arterial diseases....

Night phone call from the patient after endovenous laser ablation
- severe pain and irritations in the thigh after compression implementation

Whole body itching, redness, skin irritation (including upper limbs) after class II medical compression stocking.

Medical compression related adverse events

| Reported adverse event | Incidence |
|------------------------|-----------|
| Blisters                | common    |
| Skin irritation         | common    |
| Allergic skin reaction  | very rare |
| Discomfort and pain     | common    |
| Anastomotic anastomosis | rare      |
| Bacterial and fungal infection | very rare |

Note: The list above includes some severe complications that can occur with the use of medical compression. It is important to monitor patients closely and to follow proper compression application techniques to minimize the risk of complications.
Recommendation 1. We recommend that every patient receiving compression therapy should be screened for conditions that increase the risk of complications, and every compression device should be checked for appropriate fit and application. Contraindications for compression treatment must be considered to limit the risk of side effects.

Medical Compression (common) adverse events:

- **Skin irritation**
  - Chronic venous congestion
  - Previous skin abnormalities
  - Direct influence of the compression
  - Itching, Skin irritation, Skin dryness

Recommendation: Adequate skin care to prevent skin irritation in patients with sensitive skin.

Recommendation: Avoiding potentially allergenic substances and dyes in compression materials.

Skin inflammatory reactions: adverse reaction based/observed rather in the rubber based compression products as well as in the products containing the paraphenylenediamine or cross-compression tape/threads based skin irritation and discosulation due to continuous bandage effect.

Skin/Soft tissue damage/necrosis – special precautions

Recommendation 10

We suggest specific precaution (padding, special care of fit, low pressure) and close controls at the initial stages of compression therapy in patients with polyneuropathy and elderly patients with frail, atrophic skin (dermatoporosis).
Skin, soft tissue injury or necrosis as well as nerve paresis related to compression pressure and/or unproper adjustment

KEY POINTS

- **Bone or tendons interposing e.g. above ankles, the tibia, the fibular head or above tibialis anterior.**
- **Arterial insufficiency not related to higher local pressure than flat areas.**
- **Additional risk factors for tissue necrosis known: severe PAD, severe microangiopathy, neuropathy, previous skin injury.**

**Recommendation 9:**

To prevent tissue damage or necrosis and nerve damage to regions with a small radius, we suggest protecting these regions (tendons, nerves and bones) from inappropriate high pressure, particularly in patients with sensitive skin, by:

- Decreasing the local pressure by inserting soft padding material.
- Using low overall pressure.
- Taking proper circumference measurements so that the compression devices fit properly.

**Recommendation 13:**

Severe PAOD (systolic ankle pressure <60 mmHg, toe pressure <30 mmHg) is a contraindication against compression therapy with Medical Compression Stocking.

**Recommendation 14:**

In every patient with impaired perfusion of the lower limb (ABI < 0.9), the clinical effect of the MCS on leg blood supply should be carefully monitored. If the situation is not recognized, there is a possibility of developing non-healing skin breaks even under low pressure MCS.

**Absolute contraindications to Medical Compression in 2024:**

- In patients with severe PAOD with any of the following: ABPI < 0.8, ankle pressure <60 mmHg, toe compression pressure <30 mmHg.

**Some of the previous contraindications become new indications for the medical compression...**

- Severe diabetic neuropathy with sensory loss or microangiopathy with the risk of skin necrosis

**„Borderline indications”**

**Individual benefit - risk assesment required**

**„Borderline” indications in PAOD patients**

1. Oedema and/or venous ulcers in mixed pathology, CVI or lymphoedema and/or PAOD
2. Oedema and/or venous ulcers in patients after arterial bypass surgery or stenting
3. Oedema after leg vein harvesting in bypass surgery

**ABI:**

- >0.5 ---- <0.8: modified inelastic compression possible
- <0.5: inelastic compression possible

**What about the use of the medical compression stocking?**

- In cases where inelastic compression of up to 40 mm Hg does not impede arterial perfusion but may lead to anamalization of the highly reduced venous pumping function.

**Stockier M. et al. Safety of a compression stocking for patients with chronic venous insufficiency (CVI) and peripheral artery disease (PAD).**

- In PAD pts: (ABI < 0.9 and > 0.5; Absolute ankle systolic pressure > 40 mmHg).
- In CVI pts: (ABI > 0.5; Absolute ankle systolic pressure > 40 mmHg).

**ABI: Oedema and/or venous ulcers in mixed pathology, CVI or lymphoedema and/or PAOD**

- Oedema and/or venous ulcers in patients after arterial bypass surgery or stenting
- Oedema after leg vein harvesting in bypass surgery

**S0 PAD pts:**

- Ankle pressures:
  - < 0.9: Absolute ankle systolic pressure > 40 mmHg
  - > 0.5: Absolute ankle systolic pressure > 40 mmHg

- Foot pressures:
  - < 0.9: Absolute toe systolic pressure > 40 mmHg
  - > 0.5: Absolute toe systolic pressure > 40 mmHg

- **Class C1 (CVI):**
  - Class C1 compression
  - Foot compression

- **Class C2:**
  - Class C2 compression

- **Class C3:**
  - Class C3 compression

- **Class C4:**
  - Class C4 compression

- **Class C5:**
  - Class C5 compression

**No skin damage**

- An increase of the big toe systolic arterial pressure immediately after dosing the medical compression stocking (from 3.1 mm Hg to 27.4 mm Hg to 30.8 mm Hg to 24.1 mm Hg) (p < 0.05)

**High tolerance of progressive elastic stockings (18 ± 2 mm Hg at calf and 8 ± 2 mm Hg at ankle level) in symptomatic PAD (ABI > 0.60 ± 0.75)**

**Conclusion:**

- Despite the presence of progressive elastic compression in symptomatic arterial disease, low ABI up to 0.80.
Can we use MCS after by-pass procedure or other kind of vascular reconstruction?

**Recommendation 15**

After bypass surgery with improved peripheral arterial pressures, MC treatment may be performed if there is no direct compression effect on the bypass itself. We suggest avoiding the compression of epifascial bypass conduits.

The higher risk of the by-pass occlusion by the compression:
- If superficial by-pass location (supra-fascial) is present
- If the very distal lower leg by-pass anastomosis was performed eg at the distal crural or ankle level

In case of the unproper application or to strong pressure there is the possible tourniquet effect along the by-pass course or in the anastomosis region.

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**Rabe E, Partsch H, Morrison N. et al.** Risk and contraindications of medical compression treatment – a critical reappraisal. An international consensus statement. Phlebology 2020; 35: 447-460

**Pathogenesis of leg swelling in DM:**

- Endothelial dysfunction/circulation injury/vessel wall permeability increase
- Congestive heart failure
- Kidney failure
- Antihyperglycemic medication (thiazolidinediones–pioglitazone, rosiglitazone especially if in combination with thiazides; plasma volume increase)
- Lymphatic system dysfunction
- Obesity
- Increase in interstitial tissue pressure in diabetic foot syndrome and infective complications

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**Borderline indications**

**Leg oedema in diabetic patients**

**Mild compression knee high diabetic socks**

- Toe-branchial index ≥ 0.3
- No SAE
- No diminishing of the lower extremity circulation

**Significant decreases in calf and ankle circumferences in mild compression group**

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**Wu S. et al.: Control of Lower Extremity Edema in Patients with Diabetes: Double Blind Randomized Controlled Trial Assessing the Efficacy of Mild Compression Diabetic Socks. Diabetes Res Clin Prac. 2017; 127: 50-53.**

Mild compression knee high diabetic socks (18–25mmHg) vs non-compression knee high diabetic socks.

** Toe-branchial index ≥ 0.3**

No SAE

No diminishing of the lower extremity circulation

Significant decreases in calf and ankle circumferences in mild compression group
Borderline indications
Leg oedema in chronic heart failure patients

Key points to note regarding case reports and experimental studies on cardiac insufficiency and compression therapy:

1. Cardiac insufficiency in itself does not constitute always a contraindication for compression therapy

2. In the disease stages NYHA I and NYHA II, appropriate compression is possible (compression of both legs may lead to a short asymptomatic increase in cardiac preload – in those patients, mild compression should start in the lower legs before it may be extended to the thigh region)

Rabe E, Partsch H, Morrison N. et al. Risk and contraindications of medical compression treatment – a critical reappraisal. An international consensus statement. Phlebology 2020; 35: 447 - 460

Recommendation 17
We recommend against applying compression in severe cases of cardiac insufficiency (NYHA IV).

We also suggest against routinely applying MCS in NYHA III cases. When needed, careful use of compression therapy in this patient group may be considered if there is a strict indication, with clinical and haemodynamic monitoring. In less severe cases, cautious increase of compression pressure only leads to very short phases of increased cardiac load and may lead to a substantial reduction of peripheral oedema.

Rabe E, Partsch H, Morrison N. et al. Risk and contraindications of medical compression treatment – a critical reappraisal. An international consensus statement. Phlebology 2020; 35: 447 - 460

Oedema induced skin/soft tissue disease

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Borderline indications
Inflammatory diseases and infections

Erysipelas
Dermatolymphangiodenitis /DLA/
Leucocytoclastic vasculitis

Recommendation 19.
We suggest additional compression, in purpura due to leucocytoclastic vasculitis and in leg erysipelas or cellulitis, to reduce inflammation, pain and oedema.

In infectious inflammation, we suggest compression only in combination with antibacterial treatment.

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