

# The new S2k Guideline: Medical compression therapy of the extremities with medical compression stockings (MCS), phlebological compression bandages (PCB) and medically adaptive compression systems (MCS)

## Die neue S2k Leitlinie: Medizinische Kompressionstherapie der Extremitäten mit Medizinischem Kompressionsstrumpf (MKS), Phlebologischem Kompressionsverband (PKV) und Medizinischen adaptiven Kompressionssystemen (MAK)

### Author

Markus Stücker<sup>1</sup>, Eberhard Rabe<sup>2</sup>

### Affiliations

- 1 Dermatology Department of the Ruhr University Bochum, Centre for Venous Disorders of the Departments of Dermatology & Vascular Surgery, Ruhr University Bochum Hospitals
- 2 Praxis Dermatologie Phlebologie Bonn

### Key words

Compression, flat knitwear, circular knitwear, decongestion phase, maintenance phase

### Schlüsselwörter

Kompression, Flachstrick, Rundstrick, Entstauungsphase, Erhaltungsphase

received 12.07.2019

accepted 12.07.2019

### Bibliography

DOI <https://doi.org/10.1055/a-0986-1720>

Phlebologie 2019; 48: 321–324

© Georg Thieme Verlag KG Stuttgart · New York

ISSN 0939-978X

### Correspondence

Prof. Markus Stücker MD

Klinik für Dermatologie der Ruhr-Universität Bochum

Venenzentrum der Dermatologischen und

Gefäßchirurgischen Kliniken

Kliniken der Ruhr-Universität Bochum

Im St. Maria-Hilf-Krankenhaus

Hiltroper Landwehr 11–13

44805 Bochum

Tel. 0234–8792–377

E-Mail: [m.stuecker@klinikum-bochum.de](mailto:m.stuecker@klinikum-bochum.de)

[www.venenzentrum-uniklinik.de](http://www.venenzentrum-uniklinik.de)

### ABSTRACT

For the first time, the new guideline for medical compression therapy addresses the different options of phlebological compression therapy. It assigns the phlebological compression bandage (PCB) and the medically adaptive compression system (MAC) primarily to the decongestion phase, medical compression stocking (MCS) to the maintenance phase. The use of flat-knit MCS is not attributed to a specific diagnosis, but to specific findings of the patient. The higher stiffness allows the use with therapy-resistant edema, the higher flexural rigidity in case of skin folds and the ability to individually increase or decrease the stitches of flat knitwear the use of exceptional caliber differences of the legs. In order to improve adherence, the lowest possible compression classes should be used for MCS. Many aspects of PCB have to be taken into account, from which results the limitation of PCB to the decongestion in this guideline. More than ever before, the goal of compression therapy is to improve patient's quality of life.

### ZUSAMMENFASSUNG

Die neue Leitlinie zur Medizinischen Kompressionstherapie geht erstmalig zusammenfassend auf die unterschiedlichen Optionen der phlebologischen Kompressionstherapie ein. Dabei ordnet sie den PKV und die MAK primär der Entstauungsphase zu, MKS der Erhaltungsphase. Der Einsatz flach gestrickter MKS wird nicht einer bestimmten Diagnose, sondern bestimmten Befunden des Patienten zugeschrieben. Dabei ermöglicht die höhere Stiffness den Einsatz bei therapieresistenten Ödemen, die höhere Biegesteifigkeit bei Hautfalten und die Möglichkeit Maschen bei Flachstrickware individuell auf- oder abzunehmen, den Einsatz bei außergewöhnlichen Kaliberunterschieden der Beine. Zur Verbesserung der Adhärenz sollen bei MKS möglichst niedrige Kompressionsklassen verwendet werden. Beim PCB sind viele Aspekte zu berücksichtigen, woraus die Beschränkung des PCB auf die Entstauungsphase in dieser Leitlinie zurückzuführen ist. Stärker als bisher wird als Ziel der Kompressionstherapie die Verbesserung der Lebensqualität der Patienten hervorgehoben.

## Introduction

The new guideline on medical compression therapy was adopted on 31.12.2018 and published online under the AWMF [Association of Scientific Medical Societies in Germany] Registry Number 037/005. The guideline is publicly accessible on the homepage of the AWMF <https://www.awmf.org/leitlinien/detail/II/037-005.html>. This guideline was drawn up under the auspices of the German Society of Phlebology and the guideline coordinator was Prof. Dr. Eberhard Rabe. Many specialist German societies (DGP [German Respiratory Society], DDG [German Diabetes Association], DGA [German Society for Angiology], DGG [German Society of Geriatrics], GDL [Association of German-speaking Lymphologists], DGL [German Society of Lymphology] and the German Professional Association of Phlebologists) as well as several other professions, e. g. representatives of nursing and care services, were involved. The most significant aspects of the guideline are selected below (always printed in italic) and their relevance compared to the previous guidelines in the German-speaking world is briefly commented upon.

*The present guideline combines relevant aspects on the use of compression therapy with medical compression stockings (MCS), phlebological (venous) compression bandages (PCB) and medically adaptive compression systems (MAC) [...] up to December 2018.*

**Comment** This is the first time in a German guideline that MCS and PCB are discussed together; this enables their differing indications to be set out more clearly. Also new is the inclusion of MAC, which represents a recent important innovation in the field of compression.

*Whereas PCB (with bandages, bandage systems) or MAC are usually employed in the decongestion phase, MCS or ulcer stocking systems are used in the longer-term treatment and maintenance phases and MCS in prevention [...].*

**Recommendation 24** *In the decongestion phase, multilayer compression bandages as well as multicomponent systems can be used, which have proved particularly effective in patients with venous leg ulcer [...].*

**Recommendation 26** *After the initial decongestion phase, treatment in venous leg ulcer patients should be switched, in suitable cases, from PCB to two-layer ulcer compression stocking systems.*

**Comment** For the first time in a guideline on compression therapy, a distinction between the decongestion phase and the maintenance phase – that has already been drawn for lymphedema therapy – is also made for venous indications. The meaning of the stated recommendations is as follows: “can” signifies a relatively weak recommendation; “should” is a stronger one and “must” constitutes a very strong recommendation. For venous leg ulcer patients in particular, the guideline focuses on multicomponent systems in the decongestion phase. The relatively strong recommendation that after the initial decongestion phase, therapy in venous leg ulcer patients should be switched in suitable cases from PCB to two-layer ulcer compression stockings is of practical importance. For routine medical practice, this means that after a few weeks, ei-

ther treatment should be changed or the reason for not switching from PCB to two-layer ulcer compression systems should be fully documented in the patient’s medical records. On the basis of this guideline recommendation, long-term compression therapy with bandages for venous leg ulcer, without a respective comment, can no longer be undertaken.

**Recommendation 4** *In the case of relatively large changes in the circumference of an extremity and/or conically-shaped limbs and with deep skin folds, a flat-knit garment should generally be prescribed, because circular-knit material is not suitable for therapy in certain anatomical conditions. For example, very large changes in circumference and/or deep tissue folds along the arms or legs can be present in severe chronic venous insufficiency, in severe lymphedema or lipedema and in obese patients.*

**Recommendation 5** *Because of the knit type, flat-knit MCS generally show a greater stiffness but also a higher flexural rigidity. These properties should be utilised for treating patients with lymphedema or lipedema, severe chronic venous insufficiency (CVI) or obesity and also in neuropathies and arterial occlusive disease in order to avoid pressure peaks caused by constrictions.*

**Comment** When prescribing flat-knit garments as an alternative to circular-knit material, it is strongly recommended that the decision should be made on an individual-patient basis according to certain features that can occur in various diagnoses such as CVI, lymphedema, lipedema and obesity, rather than selecting according to one particular diagnosis. The crucial difference between flat-knit and circular-knit materials can be summarised in the following three points:

- Greater stiffness (higher ratio of working pressure to resting pressure, especially important in therapy-resistant forms of edema)
- Higher flexural rigidity (makes it more difficult for the flat-knit material to slip, so ridges and furrows are less frequent)
- Mesh sizes in flat-knit material can be reduced or increased depending on the individual patient (hence it is possible to adjust for unusual girths of arms, legs or abdomens)

**Recommendation 9** *After decongestion in patients with venous leg ulcer, MCS treatment should be tested as an alternative to PCB.*

**Comment** The consequence for clinical practice of this strong recommendation is that if, after several weeks of the decongestion phase, no switch from PCB to MCS is made, then such a decision must be carefully documented. Hence PCB treatment for several months or years in patients with a venous leg ulcer must be justified.

**Recommendation 10** *Two-layer leg ulcer MCS should be used if compression therapy in venous leg ulcer patients is undertaken with MCS.*

**Comment** This recommendation is based on the greater practicality of the two-layer system and also on the higher stiffness, which leads to a more rapid and better healing of the venous leg ulcer.

**Recommendation 13** *The type of stocking and strength of the necessary contact pressure, i. e. the compression class, depend on the diagnosis, the site of the drainage disorder, the clinical findings and the severity of symptoms and changes (e. g. severity of edema). The rigid assignment of a compression class to a diagnosis is not sensible. The aim of compression therapy is to improve the clinical findings.*

**Comment** The guideline emphasises that compression therapy should be chosen on the basis of the clinical findings and the severity of symptoms and changes. The most important aspect for patients is that their symptoms actually improve. The virtually dogmatic assignment of compression therapy to particular diagnoses irrespective of the actual symptoms present in an individual patient is therefore not sensible! It should not be forgotten that the aim of compression therapy is always an improvement in quality of life. Hence compression therapy is to be chosen in such a way that the patients feel better with compression therapy than without it.

**Recommendation 14** *The lowest effective compression class should always be preferred. This promotes adherence to the compression therapy.*

**Comment** Analyses of prescribing practice have shown that the most frequently prescribed compression class is Class II. There is no evidence that this is a rational approach, since Class I is often fully sufficient to relieve the symptoms whilst being somewhat easier for the patient to put on than a Class II product, for example. This is another recommendation which refers to the principle that the individual circumstances in a particular patient must be taken fully into account in the choice of compression material.

*The donning and doffing of MCS of all compression classes by community nursing services is, if needed, prescribable and reimbursable.*

**Comment** Since the start of 2018, even Class I stockings can be put on and taken off by nursing services and therefore this, previously relevant, reason for not prescribing Class I no longer applies.

*Relevant indications for the prescribing of donning and doffing aids include:*

- Paralysis
- Age-related loss of strength
- Osteoarthritis/rheumatoid arthritis
- Severe obesity
- Extensive stiffening of the spine/hip/knee
- Degenerative diseases of the hands/hand region
- Consequences of injuries/amputations

**Recommendation 18** *Suitable donning and doffing aids should be prescribed in cases of impaired mobility and where there are problems in putting on and taking off the MCS.*

**Comment** Donning and doffing aids are already relatively frequently prescribed in order to increase adherence to compression therapy. The above list includes the point that is very often especially relevant to our elderly patients “age-related loss of strength”. Quite often our elderly patients themselves or their relatives actually do not have the strength to put on a compression

stocking. It is therefore particularly important that the guideline also mentions this point as a relevant indication for prescribing donning/doffing aids. Admittedly, donning is a more frequent problem than doffing, but nevertheless, doffing aids should also be considered for MCS.

**Phlebological compression bandages (PCB)** The extreme complexity of phlebological compression bandages is clear in the following classification:

*P-LA-C-E: The acronym P-LA-C-E designates a useful concept for the assessment of compression bandages according to:*

- *P (pressure): Pressure that the compression bandage exerts on the extremity,*
- *LA (layers): Overlapping of the materials, both single components as well as several, over each other,*
- *C (components): Type of material from which the individual components are composed, and*
- *E (elasticity): Elasticity that enables the material to exert a high pressure on an immobile extremity.*

**Comment** The four different parameters clearly show how difficult it is to standardize compression bandages. This is ultimately also the reason why the guideline on compression therapy of the extremities places such a high value on the switching of compression therapy with compression bandages to compression stockings after completion of the decongestion phase.

**Material tolerability** *In general, PCB are well-tolerated. An allergic reaction presenting as urticaria (immediate allergy) or as contact eczema (delayed allergy) to polyamide, elastane, cotton or viscose is extremely rare. Latex or rubber components are seldom found in compression bandages.*

**Comment** Mechanical intolerances to compression materials are more common than allergic reactions. The term “elastic stockings” still often used by patients or also the concern that the material could contain latex, is generally unfounded.

*It has not been proved that any one particular bandaging technique, e. g. according to Pütter, Sigg or Fischer, is superior to any other. [...]*

**Recommendation 23** *The following aspects should be considered in compression bandaging:*

- *A tubular cotton bandage that is pulled up to below the knee, serves to protect the skin.*
- *Padding can help to prevent pressure ulcers.*
- *Pressure cushions and pads can additionally increase the effectiveness.*
- *Bandage clips/staples are frequently enclosed but carry a risk of injury and serve only to secure the bandage when out of the packaging and are not for use on the patient (see manufacturer's information). Adhesive strips are suitable for securing the ends of the bandage.*
- *The bandage width is based on the shape and diameter of the respective part of the body.*
- *At least two bandages are generally necessary for correct compression therapy.*
- *The foot is always in the functional position (dorsal extension).*

- Right from the start of bandaging, care must be taken to ensure good contact pressure. Turns that are too loose, e. g. on the forefoot, can lead to the formation of edema.
- The roll of bandage is unrolled under permanent tension directly onto the skin, so that the bandage conforms evenly to the leg shape.
- The pressure gradient is disturbed if individual bandage turns are too tight. Constrictions can lead to venous congestion (culminating in an increase in the risk of thrombosis), pressure damage to nerves or necrosis.
- In the case of severe edema of the forefoot or lymphedema, compression is also to be applied to the toes, so as to prevent them being affected by edema.

**Comment** This is the first time that a guideline has attempted to describe the principles of compression bandaging as precisely as possible. But even these detailed instructions cannot replace thorough, practical guidance on compression therapy.

**Recommendation 27** MAC can be used as an alternative to bandaging with bandages in the initial decongestion phase for lymphedema, for severe venous edema and for venous leg ulcer.

**Comment** New types of compression systems were introduced a few years ago that are supposed to minimise the problems individually encountered by patients, therapists or caregivers when applying the previously available compression materials. These compression systems are used in the decongestion phase. Since they are much simpler to use, the application of such systems is less time-intensive and less prone to error than the laborious compression bandaging. After brief instruction, patients who are still sufficiently mobile – or their relatives – are capable of applying the systems themselves. This increases adherence.

#### Indication for medical compression therapy

**Recommendation 28** The following indications for medical compression therapy should be considered: [...]

- Improvement in venous symptoms
  - Improvement in quality of life in chronic venous disease [...]

**Comment** In the recommendation concerning the indications – of which only a small excerpt is printed here – the guideline again

places high value on the improvement in quality of life of patients given compression therapy. This gives rise to a great responsibility not only on the part of the doctor, but also on the specialist supplier, since the optimum compression material must be carefully chosen. Only well-selected and suitable compression material can develop its full effect and enable the patient to experience the positive course of/difference between therapy with or without compression. The patient should feel better with compression than without it.

**Recommendation 29** If deep vein thrombosis is diagnosed, compression therapy should be started immediately.

**Comment** It is entirely self-evident that pharmacological thrombosis treatment should be started as soon as deep vein thrombosis is diagnosed. The first dose of drug is usually given immediately after diagnosis, without first sending the patient from the practice or the hospital department to the pharmacy. With a high grade of recommendation (“must”) and based on current studies, the guideline also requires that not only drug treatment but also compression therapy should be started immediately. Due to the frequent swelling at the time of diagnosis, the patient must initially be treated with compression bandages and then with a compression stocking as soon as decongestion is achieved.

Overall, the guideline shows a whole range of indications for compression therapy for which very good evidence exists.

#### Conflict of interest

Beraterhonorar: Bauerfeind, Bayer  
 Vortragshonorar: Eurocom, Urgo, Sigvaris, Daiichi, Juzo  
 Forschungsunterstützung/Studien: Bauerfeind, Bayer, Daiichi, Mölnlycke, Medi, Eurocom

#### References

- [1] Rabe E, Földi E, Gerlach H et al. Die neue S2k Leitlinie: Medizinische Kompressionstherapie der Extremitäten mit Medizinischem Kompressionsstrumpf (MKS), Phlebologischem Kompressionsverband (PKV) und Medizinischen adaptiven Kompressionssystemen (MAK). Im Internet: <https://www.awmf.org/leitlinien/detail/II/037-005.html>