



medi

# Thrombosis Prophylaxis for Travellers

Supply needs and recommendations



medi. I feel better.

# Long journeys and thrombosis

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**We all like to travel a lot – for the majority of people, going on holiday is one of the most important things in life.**

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But the cramped seats, the lack of physical exercise and the often insufficient intake of fluids lead to the risk of developing traveller's thrombosis.

In certain groups, such as elderly or overweight people, pregnant women, or people with a family history of venous disorders, the probability is particularly high.

Travel socks with graduated compression, such as medi travel, can prevent traveller's thrombosis. Venous blood flow is increased and valve function is maintained, so that venous hypertension and oedema formation are limited and deep thromboses in the leg veins can be avoided.

## **Giving good advice and information**

As is the case for all medically related travel risks, the following also applies to thrombosis: Information on specific prevention helps to maintain health. Your patients will be grateful for valuable information.



**Whether they are healthy or have a history of venous disorders – with compression stockings, travellers will arrive safely at their destination.**



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**medi compression stands for six decades of experience in research and development of products with compression – made in Germany.**

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# medi travel® women & men

Travel compression socks for people with healthy veins (available without a prescription)

## Prophylaxis through compression socks

Compression socks increase venous blood flow and restore the valve function.

As well as this, they reduce the diameter of the veins, counteract venous hypertension and limit oedema formation. The most important triggers of thrombosis (Virchow's triad: endothelial alterations, stasis, blood viscosity) are therefore reduced.



medi travel women



medi travel men

## Standard colours



Black



Powder



Black



Grey

medi travel is available from medical retailers as a below-knee sock (AD)

# Carefree travelling with mediven® plus

Effective thrombosis prophylaxis for travellers with a history of venous disorders

Patients with venous disease have a comprehensive range of medical compression stockings at their disposal. mediven plus is an ideal garment for travelling.

## mediven plus

- in the case of moderate to severe venous disorders or varicose veins or after thromboses
- beneficial particularly in the case of sensitive or very large thighs
- soft, but still durable, and opaque material



mediven plus



Extra soft cuff and open toe



Lower pressure without any visible transition

mediven plus is available in different lengths from medical retailers; for more details, **1.800.361.3153**

# Recommendations for travellers

## Thrombosis prophylaxis as part of your medical travel advice

In order to reduce the risk of traveller's thrombosis, the calf muscle pump should be exercised during long journeys, for example by regularly standing up, walking around or doing exercises in your seat. Light-weight and loose-fitting clothing is also sensible. Luggage around your feet can additionally limit leg room and should therefore be avoided.

It is also important to make sure that you have enough to drink (water, juices). Coffee and alcoholic beverages should be avoided as far as possible, due to their diuretic effect.

Beside these general tips, there are specific recommendations depending on the risk group:

Risk group	Risk factors	Recommendations
<b>Group 1 – low risk</b>	Passengers without additional risk factors have only a low probability, but should take note of the fact that journeys of more than 12 hours can markedly increase the risk of suffering from traveller's thrombosis	<ul style="list-style-type: none"><li>• General tips:<ul style="list-style-type: none"><li>- physical exercises</li><li>- regular breaks</li><li>- loose-fitting clothing</li><li>- sufficient leg room</li></ul></li><li>• Intake of fluids &gt; 0.25 l / h</li><li>• Avoidance of tranquilizers or sleeping pills</li></ul>
<b>Group 2 – moderate risk</b>	The following factors can increase the individual risk; at least too often have a supra-additive effect <ul style="list-style-type: none"><li>• Pregnancy / Postpartal period</li><li>• Age &gt; 60 years</li><li>• Thrombophilia</li><li>• Family history of VTE</li><li>• Varicose veins or chronic venous insufficiency</li><li>• Oral contraceptives or hormone treatment</li><li>• Obesity (BMI &gt; 30)</li><li>• Clinically relevant heart disease</li></ul>	<ul style="list-style-type: none"><li>• General measures (see Group 1)</li><li>• Compression stockings (10-20 mmHg; in case of chronic venous insufficiency 20-40 mmHg are to be recommended, depending on the indication)</li><li>• In individual cases, e.g. pregnancy or thrombophilia, low-molecular heparin (see Group 3)</li></ul>
<b>Group 3 – high risk</b>	The following factors are associated with a particularly high risk: <ul style="list-style-type: none"><li>• A history of venous thromboemboli (even in the more distant past)</li><li>• Malignant or other severe diseases</li><li>• Lack of mobility (e.g. immobilisation with a plaster cast)</li><li>• Recent operations</li></ul>	<ul style="list-style-type: none"><li>• General measures (see Group 1)</li><li>• Compression stockings (see Group 2)</li><li>• Medicamentous prevention:<ul style="list-style-type: none"><li>- subcutaneous administration just before starting the journey, before all trips with increased risk of thrombosis</li><li>- High-risk dosage (analogous to prophylaxis for internal medicine patients at risk)</li></ul></li></ul>

***“Dear Colleague,***

*Especially on long journeys there is a risk of travelers thrombosis. The reasons for this include; prolonged immobilization, giving rise to venostasis. Sitting with the knee flexed and insufficient fluid intake will add to the problem.*

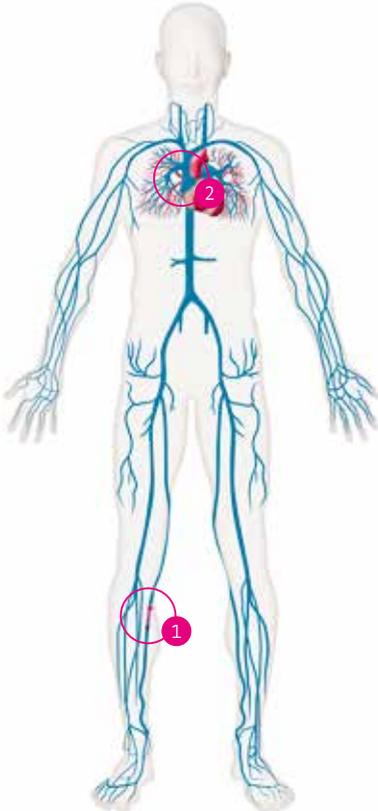
*Wearing compression stockings is a simple measure that can be taken to reduce this risk.”*



**John Scurr,**  
vascular surgeon,  
London (UK)

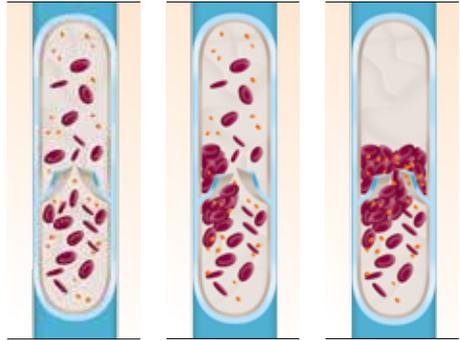
# The development of traveller's thrombosis in simple pictures

Practical explanation help for your consultation with patients



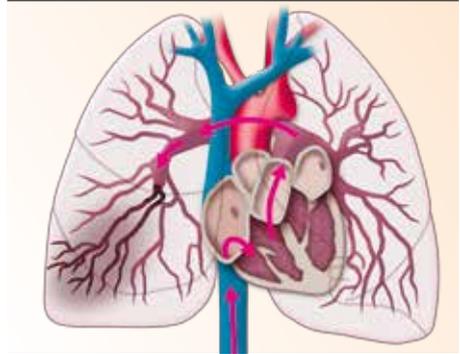
If a thrombus in the deep leg vein becomes detached, it is transported through the leg veins in the direction of the heart. In the pulmonary artery, it may become lodged in a small vessel and block the flow of blood.

## 1 Development of venous thrombi



If the flow of blood is impaired (e.g. through bending of the knee joint), this enhances blood coagulation and promotes the formation of blood clots (thrombi). Most of them occur in the deep vein system.

## 2 Pulmonary embolism as a consequence of deep vein thrombosis



If the thrombus becomes detached and is transported from the leg veins in the direction of the heart and subsequently into the pulmonary artery, it may cause blockage there. The further transportation of blood from the heart into the lungs is blocked – a pulmonary embolism occurs.

# Pathogenesis (Virchow's triad)

In the development of traveller's thrombosis Virchow's triad plays a role.

Prolonged and cramped sitting is the greatest risk factor for deep thrombosis in the leg veins. The venous flow into the lower extremities is reduced by about two thirds.

The bending of the knee joint and the accompanying constriction of the popliteal vein promote orthostatic immobilisation. Mechanical loading caused by the pressure of

the edge of the seat or crossing of the legs intensifies this effect.

In combination with a lack of physical exercise and insufficient intake of fluids, the risk of thrombosis increases – also due to its effects on the endothelium. With increasing duration of venous congestion, endothelial lesions with platelet and fibrin aggregation can occur. In addition, under moderate hypoxia, as is found during flights at a cabin pressure of 75 kPa, markers of activated coagulation can be demonstrated.

The first signs of thrombosis are a swelling in the lower leg, pain and a feeling of heaviness.



Virchow's triad on journeys

- 1 Impaired blood flow**  
Slowing of the flow velocity (e.g. through a lack of physical exercise); local stasis
- 2 Change in the composition of the blood**  
Increased viscosity (thick consistency) and increased tendency to coagulate (e.g. due to fluid deficiency)
- 3 Endothelial alteration**  
Constriction and long-term pressure exerted on the popliteal vein by the edge of the seat; changes or damage to the vascular walls

# Incidence

**Studies on the incidence of traveller's thrombosis have so far been unable to provide consistent values. But one thing is clear: the risk of suffering from traveller's thrombosis depends on individual, passenger-specific factors and on the duration of the journey.**

In a current study, 'travelling' itself was only associated with a moderate, 2-fold higher risk of thrombosis. However, this increased markedly if passengers had additional risk factors:

- in the case of travellers with a BMI > 30, the risk was increased 10-fold

- in female travellers who were taking oral contraceptives, the risk was increased 20-fold
- in the case of travellers with considerable coagulation disturbances, the risk was increased 8-fold<sup>1</sup>

The incidence of a venous thrombotic event (VTE) within four weeks in travellers with a flight duration of more than four hours was 3.2 %.<sup>2</sup>

Scientists are in agreement that the risk of suffering from traveller's thrombosis is often underestimated, since the symptoms often only occur very late and many traveller's thromboses take an asymptomatic course.



Besides individual factors, above all the duration of the journey determines the risk of thrombosis: according to one study, travelling is associated with an almost 3-fold increased risk of VTE. For every two hours of travelling time, it increases by 18 %.<sup>3</sup> In the case of air travel, the risk increased by as much as 26 %. A similar situation was shown by Lapostolle et al. for pulmonary embolisms.<sup>4</sup>

<sup>1</sup>Cannegieter, SC. et al. (2006): Travel-related venous thrombosis: results from a large population-based case control study (MEGA study), in: PLoS Med, 3, e307

<sup>2</sup>Kuipers, S. et al. (2007): The absolute risk of venous thrombosis after air travel: a cohort study of 8,755 employees of international organisations, in: PLoS Med, 4, e290

<sup>3</sup>Chandra, D. et al. (2009): Metaanalysis: travel and risk for venous thromboembolism, in: Ann Intern Med, 151, p. 180-190

<sup>4</sup>Lapostolle, F. et al. (2001): Severe pulmonary embolism associated with air travel, in: N Engl J Med, 345, p. 779-783

# Compression works

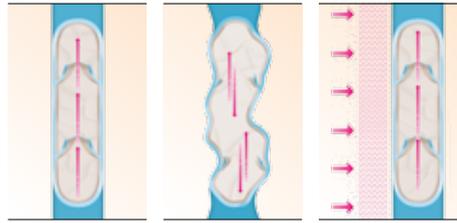
**Compression stockings can have a preventive effect on the deep leg veins via a multifactorial mechanism.**

Particularly in persons with the respective risk factors, the stockings should be used for the prevention of traveller's thrombosis. In people who have a very high probability of thrombosis, prophylactic medication can also be considered.

## The positive effect of compression

Prolonged periods of sitting and little exercise lead to high pressure on the venous system. If the traveller has a genetic disposition and other factors apply, the veins become increasingly

distended. The valves can no longer close.



Compression stockings:

- reduce the diameter of the veins
- increase venous blood flow
- reduce venous hypertension
- limit oedema formation
- restore venous valve function
- have a prophylactic effect against thromboses in the deep leg veins

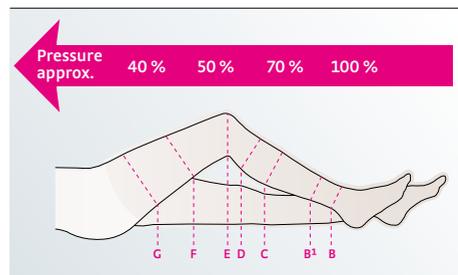
Various studies have shown that compression stockings under cCL 1 already have a positive effect on the leg veins. For patients with a history of venous disorders and travellers above risk group 2, medical stockings above 20 mmHg are to be recommended.

## Medically correct pressure gradient guarantees efficacy

When a person stands upright, the venous pressure is greatest in the ankle or foot. Therefore, this area is at particular risk of pathological disorders.

For this reason, a compression stocking exerts the highest pressure in the ankle area. The pressure is reduced higher up, to a maximum of

70 % below the knee. This is necessary to ensure that the blood is conducted from the deepest point of the leg upwards.



# High treatment compliance with medi

With medi compression technology, compression stockings offer an attractive feel-good experience for your patients – the key to higher treatment compliance.



## Highly effective therapy with the technology from medi

Depending on the product and the desired effect, the specialists at medi coordinate the technology regarding material and pressure dosing to achieve the best possible effect for your patients. Your patients will notice the marked benefit of the medicinal device and will therefore be willing to use it regularly. The centrepiece of this technology is a highly elastic fibre that is used by medi in the production of certain medical aids like the compression stockings from medi. The precisely dosed pressure of this compression fibre activates the function of the body's own transport systems deep down and thus guarantees a highly

The medi compression seal of quality is a mark of highly effective compression. The technology with the defined compression gradient promotes the return flow of blood in the veins. The result: pain and swelling are relieved and your patients feel fitter and more active.

medi compression stockings are available in many colours and variants. Even at high compression classes they are well accepted, as they are particularly comfortable to wear. A feel-good effect for which your patients will be thankful. A plus for your successful treatment.

medi compression – Quality made in Germany.

effective therapy. medi compression stands for quality. Look for the medi seal of quality in order to enable the best possible treatment for your patients and to achieve optimum therapeutic results.



**medi compression:** positive effect on health, performance and well-being.

# What patients expect of a compression stocking

**Medical efficacy is essential. But patients also attach importance to other features.**

In 2008, the market research institute GfK conducted a consumer survey on the subject of compression stockings\*. The question of what patients consider to be important in a compression stocking reveals what they value most. "Fit", "Wearing comfort", "Durability", "Ease of donning and doffing" as well as "Softness" occupy the first places.

Of course, the medical aspect is of primary importance with regard to compression stockings; after all there is a reason why patients need the stockings.

However, if a medical device also fulfils the comfort features listed here, it ensures that the stockings will be worn regularly – the key to compliance and long-term therapeutic success.

\* GfK Group, Retail and Technology, "Konsumentenbefragung Kompressionsstrümpfe 2008"

What patients want from a compression stocking...	How medi fulfils these criteria
<b>Fit / Wearing comfort</b>	As a result of the defined compression gradient, the stockings fit perfectly and feel like a second skin. Functional variants such as Clima Fresh or Clima Comfort provide for a balanced climate in the foot and have an antibacterial effect.
<b>Durability</b>	Compression stockings from medi are made in Germany and are produced in a complicated manufacturing process. All materials used are particularly durable and robust.
<b>Ease of donning and doffing</b>	Particularly when travelling, donning and doffing needs to be quick and easy. medi travel socks can be put on in a matter of seconds. For mediven plus, practical donning and doffing aids are available where indicated.
<b>Softness</b>	The materials used for medi stockings are particularly soft and close-fitting. They have been tested according to Öko-TEX Standard 100 and are very skin-friendly.

What men and women expect of a stocking

# medi can take care of you when travelling

Whether travelling on holiday or on a business trip: compression stockings can reduce the risk of traveller's thrombosis.

		Advantages for your patients
	<b>medi travel socks</b> Effective support for people with healthy veins	<ul style="list-style-type: none"><li>• medi travel women: semi-transparent, attractive below-knee sock</li><li>• medi travel men: opaque fine-ribbed below-knee sock</li><li>• very quick and easy donning</li><li>• soft, skin-friendly material</li></ul>
	<b>mediven plus</b> Effective support for travellers with a history of venous disorders	<ul style="list-style-type: none"><li>• in the case of moderate to severe venous disorders or varicose veins or after thromboses</li><li>• beneficial particularly in the case of sensitive or very large thighs</li><li>• soft, but still durable and opaque material</li></ul>

		Advantages for your patients
	<b>medi skin care range</b> specifically adapted to the needs of patients with venous disorders	<ul style="list-style-type: none"><li>• skin stressed by a venous disorder requires special care and attention</li><li>• the special skin care products from medi contribute towards improved compliance of your patients</li></ul>
	<b>medi donning and doffing aids</b> ideal for travellers, too	<ul style="list-style-type: none"><li>• simplify the donning and doffing of compression garments</li><li>• <b>medi 2 in 1</b>: save space and are quick to hand, made of extremely low-friction material</li><li>• <b>medi Butler</b>: the ideal companion particularly for elderly patients with impaired freedom of movement</li></ul>

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