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LIFE FOR LEGS

Leg problems in pregnancy



Effective steps for healthy legs during pregnancy.



Medically advise:
Prof. Dr. med. Renate Huch



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Why are varicose veins, swollen feet or other leg problems so common during pregnancy?

Complaints such as tiredness, restlessness, heaviness and tension in the legs, a tingling sensation and muscular cramp in the calf during the night, visibly swollen feet and varicose veins which appear for the first time or which become enlarged in early pregnancy are among the everyday problems facing the expectant mother.

They are especially frequent:

- if venous diseases are common in the family
- if a venous condition was already present before the start of pregnancy
- if it is not the first pregnancy
- if the pregnant woman has to sit or stand a lot – for example in her work
- if she doesn't engage in much sport or if she generally doesn't move a lot
- if the weather is hot

Not only do these complaints impair the pregnant woman's well-being and often prove cosmetically unattractive – they are also indications of possible risks, through inflammation of the pathologically dilated veins or through

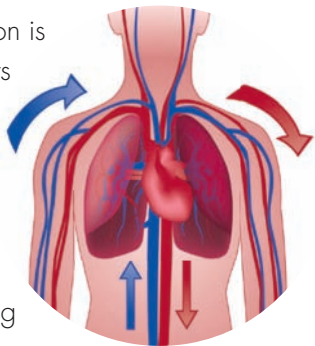


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circulatory problems, for both the mother and her baby. Therefore effective steps should be taken to prevent these problems or, if they are already present, to keep them to the minimum. This can best be done if one correctly understands why varicose veins or leg problems in general occur so frequently in pregnancy.

The task of the blood circulation

The task of the blood circulation is to supply the body with nutrients and oxygen and to remove waste products. Blood, of course, circulates in the vessels, and the driving force for this circulation is provided by the rhythmically pumping heart.



With each heartbeat blood is propelled into the circulation and returns to the heart after one passage through the circulatory system of the body. The volume of blood which is pumped by the heart, per time unit, is calculated from the heart rate and the cardiac ejection per beat.

This so-called cardiac output depends, in regard to its amount, on, among other things, the so-called pre-filling



of the heart. In other words, the better the heart is filled the more blood it can eject per beat. For its part, this pre-filling depends exclusively on the amount of blood which returns to the heart via the so-called venous backflow.



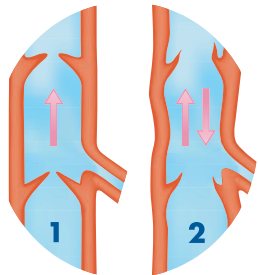
In a lying position the venous backflow causes the body no problems. There is a blood pressure gradient over the whole circulation, starting with high pressure as the blood is ejected from the heart and in the large arteries, and ending with very low pressure in the large veins and as the blood flows back into the heart. 15% of the total blood is to be found in the so-called high-pressure system, namely the arteries and arterioles, and about 85% in the so-called low-pressure system, that is, the veins and capillaries. From this percentage ratio it is not difficult to deduce that the veins have a much greater ability (=capacity) to take up large amounts of blood.

The venous backflow

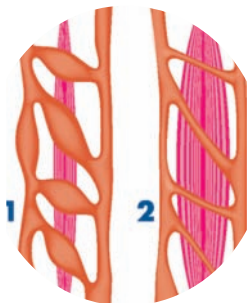
The pumping action of the heart is not sufficient to transport the blood „uphill“. The venous backflow needs to be supported by the ankle- and the calf-muscle pumps, which help to transport the blood back to the heart. Intact venous valves allow the blood to flow in the veins in only one direction, i.e. “uphill” towards the heart.

Damaged venous valves and weak pumps lead to venous problems.

1 Intact venous valves prevent blood from flowing down toward the lower part of the leg.



2 Dilated varicose veins.



1 Relaxed muscles = veins are filled with blood

2 Contracted muscles = blood is squeezed towards the heart

Problems especially frequent in pregnancy

Problems of varicose veins are particularly pronounced in women who have had a number of children. In extreme cases a woman will notice the increase in her venous problems even before she is in fact aware of her new pregnancy. In pregnancy the risk factors already described are further complicated by the following additional factors:




additional complications:

- increased blood volume
- loss of vascular tone (dilation of the vessels, through decreased vascular wall tension) due to pregnancy hormones
- pronounced increase in the pressure in the leg veins in both the lying and standing positions, due to pressure on the pelvic veins caused by the growing fetus
- changed composition of the blood, so that water can pass more easily into the tissue
- increased coagulability of the blood

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Increase in the blood volume



The blood volume already increases early in the pregnancy, by a total of about 20%, because both the uterus and the fetus have to be supplied. This is in fact a very practical measure on the part of nature: the expectant mother's respiration and her heart adjust to the circulation of the fetus with increased output, at an early stage. In the truest sense of the word, the mother's heart is beating for two! However, in the standing position this increased blood volume leads to increased «accumulation» in the legs – a factor for major problems in pregnancy.

Dilatation of the vessels

The hormones which are formed to protect the pregnancy have many points of action and many tasks. For example, they are responsible for the immobilization of the uterine musculature before the expected time of confinement.

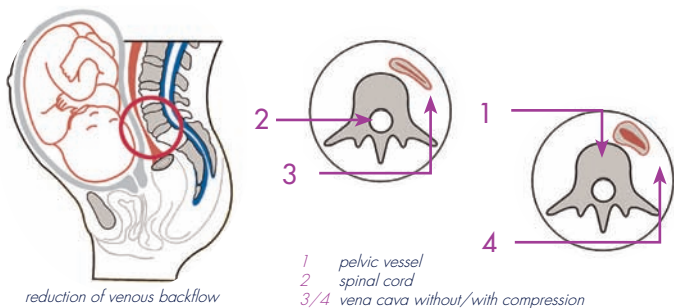


In a similar way the vessels also become «slack». The venous capacity becomes much greater. Therefore during pregnancy, and especially in the standing position, the leg veins take up a very large amount of blood, which leads to engorgement of the dilated veins in the legs and in the vaginal region. In the overfilled veins the blood circulation slows down. This is a further factor for the typical problems of pregnancy.

Increased pressure in the leg veins

In the course of a pregnancy the pressure in the leg veins increases, in both the lying and standing positions, to several times the normal pressure outside of pregnancy. Here too, the difference in comparison with the value observed outside of pregnancy is particularly great in the standing position.

One of the important reasons for this increase in pressure is illustrated in the corresponding diagram.



From about the second half of the pregnancy onward, in the lying position, but especially in the standing position, the pelvic vessels and the vena cava are pressed

together by the uterus containing the fetus. This leads on the one hand to a reduction of the venous backflow, and on the other to a reflux regurgitation in the areas below the point of compression, with increased pressure and further dilation and convolution of the veins.

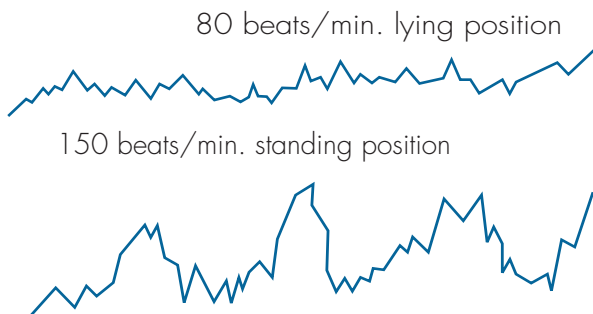
Composition of the blood

Swollen feet and edemas during pregnancy are an inevitable consequence of the increased pressure in the veins, which is higher than the surrounding tissue pressure and almost presses the fluid into the tissue. A more significant factor acts in the same direction in pregnancy. One has to imagine that the walls of the vessels have fine pores which only allow the passage of fluids and substances of very small particle size. Blood proteins, for example, can as a rule not leave the vessel, so that, conversely, they keep water in the tissue (so-called oncotic or colloid-osmotic pressure). In pregnancy, especially that protein fraction (the albumins) which is primarily responsible for the oncotic pressure decreases. As a result, in pregnancy the balance between «water-retaining» and «water-expelling» forces in the vessel is changed. A pregnant woman's feet and legs can already start to swell up after sitting or standing for only a short time – in principle this is at first a completely normal and harmless symptom. For the sake of completeness it should also be added that swollen feet can also be caused by impairment of the lymph flow under the special circumstances of pregnancy already described.

Thus there are «good» reasons for swollen feet during pregnancy. They are not pathological if the swelling occurs only after standing and walking, during the day. However, if the feet are already swollen on rising in the morning, the doctor should be consulted.



Heart rate of mother



Effects on the mother and the newborn child

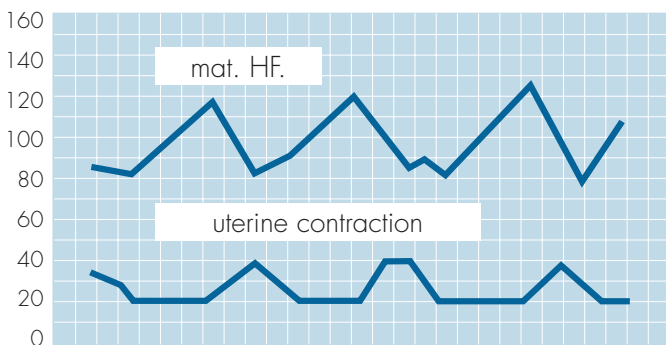
Swollen feet are without question very unpleasant and the restless feeling in the feet during the night contributes towards the sleep disturbances frequently experienced by pregnant women.

Varicose veins are not only unsightly but, as already described, they can become inflamed or lead to the development of thromboses.

Up till now, little attention has been paid to the negative effects on the circulation of the mother and the child, and the subsequent problems arising as result of these effects. The detailed description of the significance of the venous backflow, through «accumulation» of the blood in the legs, will make it easy to understand the compensatory reactions of the mother's circulatory system.

When a woman in late pregnancy stands up from a sitting or lying position, her heart rate increases much more markedly than that of a nonpregnant woman.





The body tries to compensate for the very reduced pre-filling and the consequently reduced ejection per heart-beat in the standing position, by greatly increasing the heart rate, in order to keep the blood pressure constant and to prevent fainting. If there is a pronounced fall in the stroke volume due to the inadequate pre-filling, even the greatest possible increase in the heart rate is insufficient to maintain a high cardiac output. An inevitable consequence of this is a reduction of the supply of blood to many organs. As has already been observed, the uterus is obviously one of the organs affected by this reduced blood supply. In many cases the recording of the fetal heart action shows that when the mother is in the standing position this constitutes a stressful situation for the fetus. Furthermore, a completely new and exciting observation has been made: from time to time – about once every one or two minutes – the mother’s heart rate, in the standing position, returns to normal, and it is possible to simultaneously observe or measure a contraction of the uterus, as shown in the diagram.

It is believed that through the muscular contractions the uterus overcomes the effect of the compressed vessels

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and releases the venous backflow again. Then, with adequate pre-filling, the heart no longer needs to beat so often – the result can be clearly seen in the diagram. Why and how the uterus is caused to contract is still not known.

Standing for long periods during pregnancy – does it cause premature labor?

Long periods of standing, for example at work, could therefore also be very detrimental for the unborn child. On the one hand, according to experience up to now, it is possible that the fetal circulation is impaired if the mother's blood accumulates in the legs instead of flowing to the fetus. On the other hand,

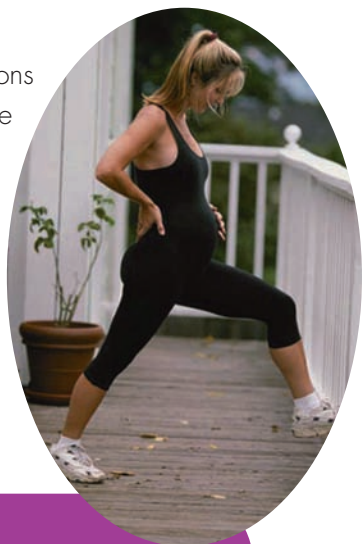
the recent findings on the onset of labor pains in pregnant women who are called upon to stand for long periods are not to be ignored. Up till now, the high incidence of premature delivery in women who have to stand a lot during pregnancy has been attributed to the stress caused by their physical activity. Perhaps

the apparently quite simple problems with the leg veins are also responsible here.



A good reason for doing something about leg problems.

There are thus sufficient reasons for trying to prevent or alleviate leg problems:



because:

- cosmetically they are unsightly
- they disturb the woman's wellbeing during pregnancy
- they constitute a risk of phlebitis and thromboses
- they place a great strain on the circulation, for both the mother and the child
- it cannot be excluded that in the broadest sense they have something to do with the onset of premature contractions

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What is to be done?

Almost inevitably the answer to this question depends on a full understanding of the causes of leg problems in pregnancy.

All measures, which reduce the pressure in the veins, prevent hemostasis and help to drive the blood «up hill» towards the heart, are useful.

A pregnant woman should as a rule not resort to the use of drugs. The danger that the baby will be more harmed than helped is too great. Surgical measures are also generally to be avoided during pregnancy.

Wear **SIGVARIS®** compression stockings/panties from the beginning of pregnancy.



How can congestion in the legs be avoided in a harmless way?

Suggestions:

- During pregnancy avoid standing still frequently as much as possible
- Do not sit too low down
- Avoid the hard edges of chairs
- Walk, hike, swim and cycle a lot
- Actively move your legs as often as possible
- Wear medical compression stockings, e.g. **SIGVARIS**
- Do not take hot baths
- Avoid long periods of sunbathing (the vessels become even more dilated)
- Actively cool the legs down (pour lukewarm or cold water over the legs, from the feet upwards)
- Lie comfortably with the legs slightly raised

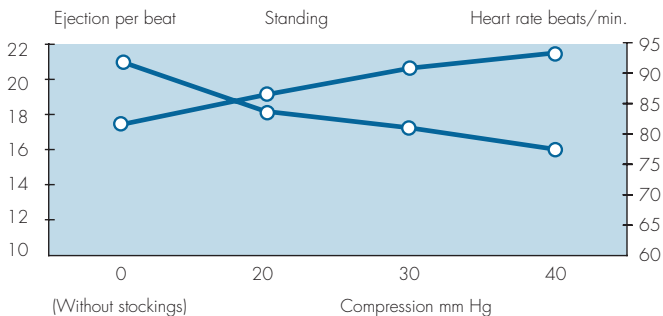


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For pregnant women who want to prevent varicose veins or who already have leg problems there are good arguments for wearing compression stockings for the full nine months!

1. The effects of the accumulation of blood on the legs (varicose veins, swelling, discomfort) can be prevented or reduced.
2. The positive effects on the mother's circulation are unexpectedly great and it can be assumed that there is a similarly positive effect on the unborn child.

Compression stockings are capable of mechanically counteracting the raised internal pressure in the vessels with a certain external pressure. In this way more blood is driven back to the heart and there is better pre-filling of the heart, so that the ejection is also improved (=increased cardiac output). As already described on Pages 5/6, the heart can then beat more slowly, while in spite of this it ejects the same or a larger amount of blood per time unit. The good effect of compression stockings on the circulation can therefore be demonstrated by the fact that after putting the stockings on the cardiac ejection per beat becomes greater while the heart rate becomes



slower. This has been systematically measured at the Zurich (Switzerland) University Women's Hospital.

It can be seen that with increasing compression (=external pressure) the heart rate falls, while the cardiac ejection increases. In this situation the heart works much more economically and the physical load is much less. In the same hospital it could be observed that the acceleration of the heart rate which compensates for the obstruction of the backflow caused by the growing uterus in the pelvis becomes less pronounced after compression stockings are worn, and that the uterine contractions induced in this way also decrease.

It is therefore not wrong to assume – although it is certainly not yet proven – that women with a tendency to premature labor benefit from wearing compression stockings as a precautionary measure. Anyway, it is certain that the blood does not remain in the leg veins and that sufficient blood can be supplied to other organs.

With knowledge and understanding of the various relationships and situations described here, a pregnant woman who is looking forward to the birth of her child and who takes her pregnancy seriously should be sufficiently motivated to wear com-

pression stockings. In this way, for both the mother and her child the chances of having an uncomplicated pregnancy are clearly increased.



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To be on the safe side. SIGVARIS

SIGVARIS compression stockings and panties comply with the latest medical and scientific findings. Millions of people worldwide have full confidence in the vast product assortment, available in all compression classes and adapted to specific and individual needs.



With the relative high pressure in the veins of the leg during pregnancy only compression stockings of Class 2 are suitable, e.g.

SIGVARIS Glamour, Cotton 212, 222,

Traditional 503, Top Fine 702, Stockings of Compression Class 1, e.g. Glamour, Cotton 211, 221, Top Fine 701, can be worn as a precautionary measure, i.e.

when there are still no leg problems present.

A variety of styles – from calf models to panties – guarantee a medically correct compression and fulfill the highest esthetical and fashionable demands.

SIGVARIS compression stockings keep your legs comfortably healthy.

A stocking for every requirement

MAGIC –
Satisfaction at its best



TOP FINE –
Opaque, extra soft
and comfortable

COTTON –
The pure cotton feeling



TRADITIONAL –
High efficiency at top level

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SIGVARIS is the specialist worldwide in compression therapy and has nearly 50 years of experience. **SIGVARIS** has the right stocking for every leg in terms of:

- comfort
- appearance
- medical proof and effectiveness
(confirmed in different studies and through official quality labels)

Best quality for high standards

SIGVARIS stands for medical compression therapy at the highest level. Our goal is to increase quality of life of people suffering from venous disorders - through a highly versatile assortment and the top quality of our compression stockings. All stockings are certified by the GZG-RAL 387 (2000) quality assurance and comply with the Oeko-Tex-standard.

In order to maintain the top quality standard, **SIGVARIS** compression stockings are manufactured in our own production facilities, all having a certified quality control management. Our daily commitment is to produce only the best quality stockings, satisfying our customers high demands.

Swiss quality at its best.

For additional information about **SIGVARIS**, please consult your **SIGVARIS** dealer or our Web site:
www.sigvaris.com

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Your specialized dealer:

Are you interested in receiving additional information regarding the topic «healthy legs»? The following information brochures are available:

- »When your legs ache« brochure
- **SIGVARIS** complete folder of product range
- Varicose Veins brochure
- Compliance brochure

Please contact your **SIGVARIS** dealer for further information.

GANZONI & CIE AG
Gröblistraße 8
CH-9014 St.Gallen
Tel. +41 (0) 71 279 33 66
Fax +41 (0) 71 274 29 29

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