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DEUTSCHER DIABETIKER  
BUND e.V.

Bundesverband

**2021**

Healthy feet.  
Also in diabetes.

**STRONG  
TOGETHER**

for the well-being of the feet



# When feet have sugar

Between eight and nine million people in Germany have diabetes. Common accompanying signs of diabetes include dry skin and excess callus on the feet. They are partly responsible for serious foot complications such as diabetic foot syndrome, which may result in amputations. But this can be avoided with the right care.

Diabetes is a chronic metabolic disorder which is marked by elevated blood sugar levels. Diabetes is differentiated into two types. Approximately 95 percent of affected persons suffer from type 2 diabetes. Other diabetics suffer from the insulin-requiring type 1. The symptoms of diabetes are not always clear, so that it often takes some time for it to be discovered. But the earlier the illness is detected, the easier it is to help patients. This also applies to the symptoms that accompany diabetes.

## **About problem feet...**

Diabetic foot syndrome is one of the most common consequential disorders. It is also called diabetic foot. All diabetics should be informed about this. This consequential disorder mainly affects the skin on the feet. Its circulation is not as good as it would normally be. The skin nerves do not function properly. Consequently the skin forms fewer lipids and less moisture. But lipids are an especially important component of the skin barrier. Lack of skin lipids means that the moisture stored in the skin evaporates more easily. The skin dries out rapidly and begins to itch. It becomes severely scaly and cracked. Bacteria and other pathogens can become embedded in these fissures, causing inflammation.

## **...to problem feet**

During these inflammations, ulcers which may extend to the bones can form, usually on the soles of the feet. Such wounds can also form easily underneath callus weals. If the function of the skin nerves is impaired, the person's gait may change. Certain areas of the foot sole are more severely strained in this case. The skin reacts to this stress with a natural protective mechanism: The callus layer thickens in the affected areas.



Left untreated, however, the weal intensifies the pressure effects on the underlying tissues until a wound forms. In the worst case, such wounds or ulcers may lead to amputations. 85 percent of all amputations in diabetics were preceded by a foot ulcer, which subsequently developed severe infection or gangrene. The number of amputations among diabetics is around 40,000 per year, and it is estimated that about four out of five of these amputations were avoidable. It is especially problematic that due to a nerve disorder, many diabetics feel no pain and do not even notice the foot problems or wounds.

### **How is diabetes related to dry skin?**

About one of every three diabetics is familiar with this problem: dry skin on the feet and legs. Diabetes itself does not cause this; it is instead due to a nerve dysfunction that may be triggered by diabetes. These nerves have a special significance to the skin. They regulate the function of the smallest blood vessels, which supply the skin with blood and moisture. When these motor functions of the blood vessels no longer work properly, this is called microangiopathy. The skin lacks moisture and becomes dehydrated. It is also missing important substances that store moisture in the skin, such as urea. In diabetics, in other words, reduced skin circulation due to microangiopathy is often the factor causing foot problems.

Info

# Pay attention to your feet

Diabetes is becoming the number 1 disease of the people. More and more people are suffering from elevated blood sugar levels. The feet are also frequently affected as a consequence. However, their care is often insufficient. This is often pointed out in the GEHWOL Diabetes Report, a representative survey of doctors about the findings from about 2,800 diabetics in Germany.

About six million people in Germany state they have diabetes. Including the estimated number of unrecorded cases, this is likely to amount to between eight and nine million. Foot problems such as excess callus, foot and toe deformities, dryness of the skin, changes in gait as well as fungal infections are among the common consequential complications of diabetes. According to the recommendations by the Federal Physicians' Chamber and the Federal Association of Health Insurance Funded Physicians, consistent foot care can prevent this. However, many diabetics do not even know that they can do something for the health of their feet, too. This is shown by current results of the GEHWOL Diabetes Report. For this investigation, the research institute INSIGHT Health and the IDS GmbH jointly surveyed 2,793 diabetics from the treatment pool of 107 physicians' practices. 37 percent of patients do not even know that they have to pay special attention to their feet. 39 percent do not know what an ulcer is, or how one develops. And only 22 percent have custom shoes. A fundamental problem here is that in total far too few diabetics receive a corresponding preventive training.

## **Know-how builds trust**

There is actually a clear plan. Once diabetes has been diagnosed in patients, they should be trained and learn to check their feet and keep them injury-free with care on their own. In Germany this concerns at least six million diabetics. This is specified by the national care guideline for diabetic foot, which is currently undergoing revision. But the reality looks different. Not even half of all diabetics (only 33 percent) have received such training. Also less than half of the patients with problem feet obtain

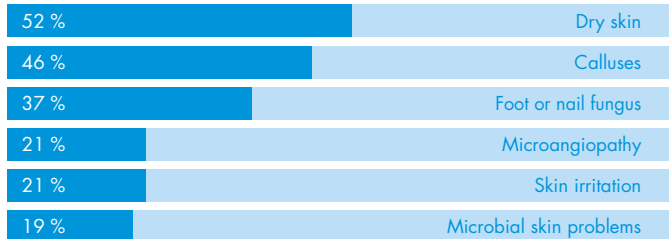


**37%**  
of diabetics are not aware of the fact that they should pay attention to their feet

**33%**  
of diabetics receive specialised training on independent foot inspections and foot hygiene

podological care, which constitutes a serious structural problem. Because in about 5,000 podology practices, which have been approved by a health insurance fund for the treatment of the diabetic foot, no complex arithmetic is required to know that the podological treatment options for diabetics alone won't be sufficient in the long term in view of increasing patient numbers in Germany. About 500,000 persons per year become newly ill with type 2 diabetes here. Therefore, to ensure the treatment and thus the early education of diabetics, all professionals need to cooperate closely. These include diabetologists, general practitioners, clinical foot ambulances, diabetes consultants, podologists, orthopaedic shoemakers as well as pharmacists and pharmaceutic technical assistants. At the regional level, there are already many networks in which diabetics are looked after expediently in an interdisciplinary manner. Successfully! For it has turned out that where there is a network, considerably fewer amputations must be conducted – an important advance!

What are the most common foot and skin problems in diabetics?



(Source: GEHWOL Diabetes Report 2021 (N = 2,793 diabetics))

# Ask for help

Dry skin, cracked callus or foot fungus – the problem is easily recognizable as soon as you notice itchy areas on the feet for the first time. This is not the same in diabetics. Since diabetes can impair nerve function and therefore pain sensitivity, the affected person may not even perceive the alarm signals. Therefore, foot problems frequently go unnoticed.

Fundamentally, proper treatment of diabetes mellitus must also include regular foot examinations. A professional medical foot care provider or podologist is the first point of contact in this case. Such professionals have well-founded medical knowledge and can cooperate closely with the treating doctor or an outpatient foot department. The foot specialist can also work with the doctor, a diabetologist, orthopaedist or internist to develop treatment concepts. Such a cooperation ensures optimal patient care. Since 2002, podological care is part of routine diabetic care. In other words, treating doctors can refer patients with foot problems to a podologist by using a prescription for curative aids.

## **Early detection and treatment**

Foot care providers and podologists can provide competent advice to their patients and recognize even the smallest changes at an early time. In this way, foot problems can usually be corrected at an early time, or at least greatly reduced. Foot inspections or treatments should take place at least every four to six weeks. If patients cannot come to the practice, many foot care pros will do home visits on request. During such routine check-ups, foot specialists check for fungal diseases, ingrown toenails, pressure spots, weals, corns or other changes of the feet and toenails. Finally, they are treated with suitable care under hygienic conditions.

For instance, if there are ingrown nails, the professional makes a nail brace and applies it to correct nail growth. He or she removes weals or painful corns with the greatest of care, using modern foot care equipment which guarantees high hygiene standards. Foot care pros can also reduce pressure on the feet by using polymer gel pressure relief products or a special customized orthotic. Such measures can prevent



further weals or calluses. A pressure or gait analysis can furthermore be done for this purpose to identify any wrongly applied strain on the feet. Such strain is often the cause when weals or corns reappear after a short time. In this case or if patients turn out to be wearing unsuitable shoes, podologists can also send them to a specialist for customized orthopaedic shoe products.

### **Competent advice and care tips**

Luckily most foot problems pass more or less quickly with early detection and appropriate treatment – in other words, with professional care. Trust the specialists for this. But also trust yourself. Failure to adequately care for your feet makes it difficult for a foot care pro to give you the right long-term care. Your foot care pro can provide you with information on how to look after the well-being of your feet, as well as the right care and exercises. You can also ask for advice during trainings with a diabetes consultant or at a pharmacy. Go ahead and ask the experts for advice.

Info

Every person travels nearly 160 000 km on foot in their life. That's four times as far as the average circumference of the planet. Foot problems are therefore not unusual. They affect everyone.

# Shoes without pressure

Wrongly fitting shoes often cause foot injuries. Therefore, orthopaedic shoe technology is very important in both prevention and therapy for diabetics. They provide consistent pressure relief which contributes to avoiding tissue damage. Mobility without risk and with maximum pressure relief is the goal.

For this purpose, the orthopaedic shoemaker first determines the stress zones. This is done by taking an electronic pressure measurement of the foot sole while walking (dynamic pedography). To do this, the patient will wear flexible measuring insoles or step on a measuring plate with many integrated sensors that record the pressure distribution on the feet. A gait analysis can help to find out whether there are any changes in the body statics. Every step is directed by a complex interplay of the bones, joints, muscles, ligaments, tendons and nerves that distribute along the body axis from the spine over the hips and knees to the feet and toes. Any changes along this axis, such as a tilted hip or stiff joints (for example arthritis), can interfere with the movement process while walking. This negatively affects the arches of the feet. Pressure weals start to form, and the foot and toes lose their natural shape.

## Tip

### **Choosing the right shoes!**

Make sure that the shoe is sufficiently wide and long and has a wide opening. There needs to be enough space for insoles. Heels should have a maximum height of 4 cm for women and 3 cm for men. A stiff sole is good to allow for later customizations. The material should consist of actively breathing leather and have no sharp-edged eyelets. Always test new shoes: It is enough to walk in them for 10-15 minutes. Then check your feet for pressure spots. Never walk without shoes, not even at home, and best of all, wear cotton socks. Look for foreign particles before and after every use, and change your shoes in the course of the day. Take the insoles out to air them. Stay away from chemical cleaning products.





High heels stress the feet and are therefore off limits. On the other hand, orthopaedic insoles, customized shoes or specialized shoes are helpful for relieving pressure.



### How to reduce strain

Orthopaedic shoemakers use various measures to correct these disorders and ensure sufficient, comfortable pressure relief. This care includes:

- Individual insoles (diabetes-adapted foot beds): Several soft layers distribute pressure evenly under the sole of the foot, reducing pressure in especially stressed areas.
- Orthopaedic shoe adjustments: Shoe technicians can individually adapt standard shoes to prevent pressure and friction spots. For this purpose, he may make changes to the walking sole, heel, front and/or back caps and the tab.
- Made-to-measure orthopaedic shoes: Custom shoes can be made for foot deformities or if there is a high risk of wounds due to a nerve or circulatory disorder. They have a raised heel cap, generously spacious interior, soft upper leather without a hard toe cap and a seamless inner lining. The sole is rigid or flexible as needed.
- Confectioned therapy shoes: These shoes are used if a foot wound or infection is already present. This generally affects the frontal feet. For this reason, the relief shoes have a raised and lengthened heel. This prevents the frontal foot from contacting the floor during the rolling process, protecting the wound area against stress and pressure peaks.
- To relieve occasional pressure pain, there are also special medical devices. These pressure relief articles are made of polymer gel, a very flexible material whose shape and hardness is precisely adapted to the stressed foot areas.

# Foot care as a ritual

Everyone can contribute a lot to making sure that diabetes will not cause further complications. Since the most common problems occur on the feet, they require your special attention.

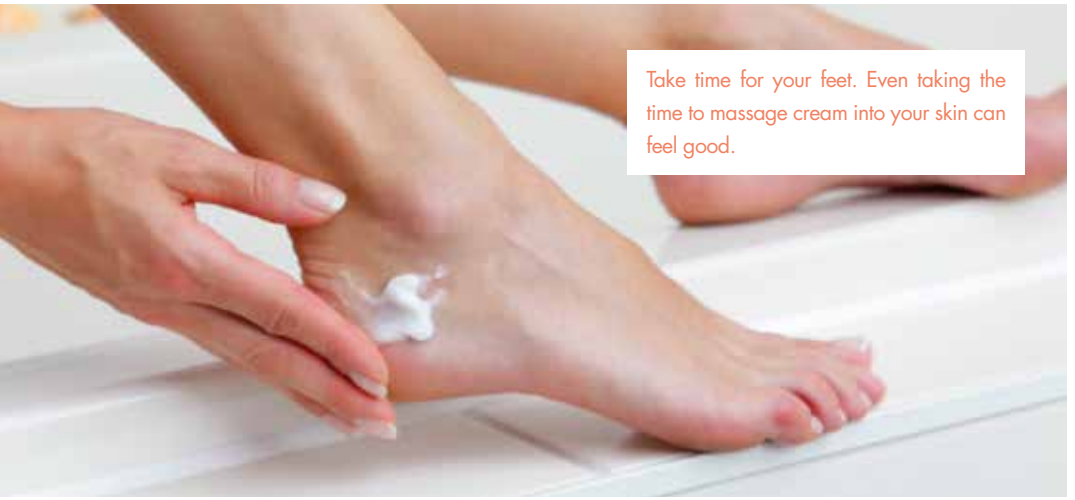
Regular visits with a foot specialist are mandatory. You also have to engage in regular, intensive home foot care. Errors during foot care, e.g. using shears and sharp planes or clippers, often result in dangerous foot injuries.

Turn foot care into a daily ritual. In this way, the measures recommended by the experts will quickly become part of your routine. And this will help you to avoid dry skin, excess callus, cracks, inflammation and similar risks. It is best to get advice from your foot care professional. Or ask the trained staff at the pharmacy. Special training with a diabetes consultant also helps with learning everyday behaviours that are appropriate for diabetes.

## Tip

### You should take this into account

- You should examine your feet and soles with a mirror at least once daily to check for redness, pressure spots, swellings, blisters, cracks, foreign bodies and injuries. Also do this after long walks, or after breaking in new shoes.
- File your nails down straight once a week with a sandpaper or diamond file. After filing, the toenails should end parallel to the tips of the toes. Extremely rounded nail corners encourage inflammation of the nail bed and can cause the nail edge to painfully grow into the flesh. You should absolutely avoid sharp instruments such as forceps, clippers, shears or pointed files. They are always associated with a risk of injury.
- Sharp tools are also completely taboo when removing excess callus. You should especially avoid callus planes, metal rasps, knives or razor blades. Sandpaper callus files, natural pumice stones or a fine callus sponge are much better suited. If you use a callus cream, pay attention to using foot care products that do not contain salicylic acid.



Take time for your feet. Even taking the time to massage cream into your skin can feel good.

- Foot baths are allowed when the skin is intact, however, not longer than 3 - 5 minutes and with a maximum water temperature of 37 – 38 °C. You should always measure the temperature of your footbath with a bath thermometer. Use your hands or a soft washcloth to clean your feet - never a brush or massage gloves. After the bath, dry the skin with a soft towel, and the spaces between the toes with a cotton swab.
- The skin should be creamed with a special foot care product every morning and evening. Make sure that the product matches your skin type, for example, has been developed especially for dry skin, hard skin, cracks or sensitive skin and is suitable for diabetics.
- Use socks with no seams on the inside, preferably made from cotton. Synthetic socks are not suitable because they do not allow for good evaporation of sweat.
- Disinfection and a sterile bandage are mandatory for small injuries. You should immediately see a doctor if you have larger injuries, signs of inflammation, fever or chills.
- You can encourage your foot circulation with mild home foot exercises and also strengthen the foot muscles in this way. This principle stays true even with diabetes: Exercise equals mobility.



Shorten your nails with a sandpaper or diamond file to keep them from growing in.

# Well-informed purchases

Dry, brittle skin which tends to develop callus is a frequent accompanying symptom of diabetes. The cracked skin barrier allows moisture to escape. Pathogenic agents can also enter easily. Care must aim to preserve the protective functions of the skin.

When the skin is dry, the uppermost skin layer – also called the callus layer – lacks moisture and fatty substances (lipids). The skin feels rough, scaly, matte with low elasticity and tends to form more callus than usual. Itchiness is another symptom, and a major problem for diabetics. Itchy skin can cause you to scratch. This may injure and infect the skin with pathogens. Especially in combination with insufficient circulation, this may cause deep foot wounds (ulcers), i.e. diabetic foot syndrome.

## **From dry to sensitive skin**

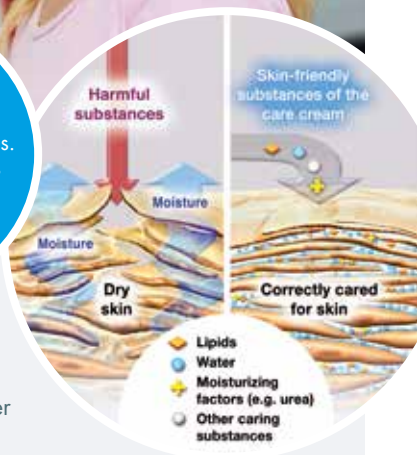
The outermost skin layer forms a kind of protective barrier. It keeps pathogens out, but also ensures that the amount of skin moisture which is evaporated out does not exceed the required amount to regulate body temperature. The barrier consists of various skin fats (lipids), dead skin cells (callus cells) and moisturizing substances which store water in the callus cells. Due to its composition of various lipids and bound moisture, this outer protective layer is also called the hydrolipid barrier. The barrier function fails when there are too few fats and moisture. More moisture evaporates in this case, dehydrating the skin (also see the graphic). Under pressure, the skin begins to callus heavily, forming permanent skin cracks. Bacteria can settle here. The skin reacts sensitively to this; itching and redness occur.

## **What should care focus on?**

Consequently, the goal of caring for dry foot skin must be to increase skin moisture. For this purpose, GD Association for Dermopharmacy recommends care products that compensate for the lack of moisture and fat in the dry skin and thus improve its barrier function. Suitable products should be easily absorbed from the user's perspective, but must absolutely have a sufficiently high fat content and may need to contain additional



If the skin lacks fats and moisturizing substances, it dehydrates. Suitable care products compensate for such deficiencies.



moisturizing substances. Suitable products will improve barrier performance, leading to better water retention in the upper callus layers.

### Choosing the right product

Advertising often tells us that certain active substances are good for skin moisture. Of course, such substances exist. But we should always remember that it is not the substance alone, but the entire formulation of a care product that makes it effective. The pharmaceutical and dermatological formulation of the product should ensure that the individual ingredients are high quality and optimally complement each other's effects. The formulation should fulfil the legal requirements at a minimum, but should ideally also be oriented to scientific recommendations and guidelines. This also means that the efficacy of the products should ideally be proven by suitable scientific methods. This gives users greater security. Choosing the right products according to this standard requires some expert knowledge - for example that of a dermatologist, pharmacy staff and well-trained foot care pros and podologists. You should therefore obtain advice from such an expert before buying your products.

# Care concept for diabetic feet

Diabetes may cause various skin problems on the feet. A cascade of various skin problems also requires different care approaches. This is what the care concept of GEHWOL med stands for.

## **Intensive care**

GEHWOL med Lipidro Cream is the established intensive care in the product range. In a study\* with type 2 diabetics, various properties were identified that are useful for diabetics: The cream increases the barrier protection and moisture of the skin; this results in more moisture and less water loss. The cream also improves microcirculation, which means: skin circulation increases by 16 percent. Diabetics benefit from this. Especially with them, poor skin circulation is often the reason why their skin is dry. 96 percent of the users report a very good or good skin feeling. The cream can be applied between the toes. In general, diabetics are advised to be careful. Depending on the emulsion, creaming between the toes can cause the skin to swell and bacteria to settle there. The study showed that the GEHWOL med Lipidro Cream does not cause a higher bacterial population between the toes.

## **The specialists for special cases**

With the GEHWOL med Callus Cream you can reduce excessive callus to a normal level. For this, the cream uses urea in elevated concentration (18 percent) and other moisturizers. If cracks have already formed, GEHWOL med Salve for cracked skin is the right choice. It has a regenerating formula including amongst others panthenol to aid wound healing. Itching, burning and redness are signs of sensitive skin which tends to become inflamed. The natural skin barrier is disturbed. Bacteria, fungi and allergens are more easily able to penetrate the skin. The skin is irritated and reacts with irritation. It needs regular care and protection. GEHWOL med Sensitive is the best option specifically for this sensitive skin type. Its triple active protection with highly purified microsilver relieves itching, reduces redness, counteracts the excessive spreading of germs and thus protects against infections.



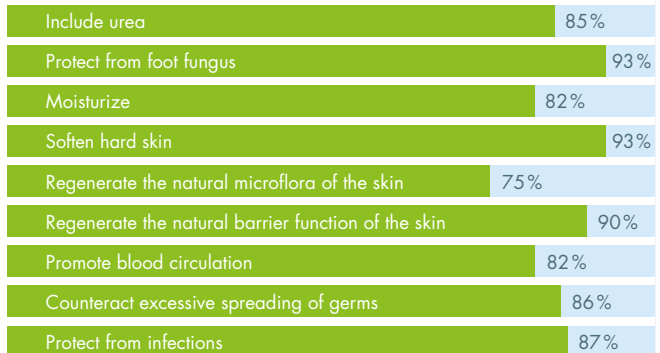
### The care for in between

For the extra portion of care in between, you can put on an alternative presentation to the cream: With its 4-times hydro-complex of evening primrose oil, moor plant extract, urea and avocado oil, the GEHWOL med Express foam also provides a rapid moisturizing boost for the skin on the go.

All products of the GEHWOL med care concept are available exclusively from pharmacies and foot care or podology practices.



### According to doctors, a foot cream should offer the following benefits...



Source: GEHWOL Diabetes-Report 2018

(N = 157 Doctors)

\*Study: Braun N et al. Akt Dermatol 2018; 44: 144-151,doi:10.1055/s-0043-123149.

Download: <http://geh wol.de/downloads/Lipidro-Studie-2018.pdf>

# Foot check-up

## Shoes

- Is the upper part of the shoe deformed?
- Is the heel worn down on one side?
- Are the heels higher than two fingers?
- Do your toes touch the inside of the shoe?
- Do your heels touch the heel cap?
- Do you feel constrictions, eyelets or seams?
- Is the insole incomplete or wrinkled?
- Do you feel that the foot bed is too hard?

**In these cases, the shoe is not suitable.**

## Socks

- Does the sock have inside seams?
- Is the sock made from synthetic fibres?
- Does the sock have elastic knit into the cuff?
- Do you feel or notice wetness from sweat?

**In these cases, the sock is not suitable.**

## Naked feet

- Do you feel pressure spots or blisters?
- Do you see redness or swelling?
- Does the foot tend to develop warts?
- Do you have corns?
- Does the skin have cracks?

**See a foot care pro. Have your shoes checked by an orthopaedic shoemaker.**

## How the skin feels

- Does your foot skin feel dry?
- Is the skin scaly and sensitive?
- Does your skin itch on your shins?
- Do you have a feeling that your skin is burning?
- Are there areas where the skin is callused?
- Does the skin have cracks?

**Pamper your feet with a foot cream which provides fats and moisture. Gently remove callus.**

## Between the toes

- Do you see injuries?
- Is the skin wetting?
- Are there white coatings on the skin?
- Do you notice severe itchiness?

**Attention – foot fungus! See a doctor.**

## Nails

- Are the nails thickened or brittle?
- Do the nails have a white or yellowish discolouration?
- Are there structural changes of the nail plate?
- Is the lateral nail edge inflamed?

**See a medical foot care pro or podologist if you have ingrown nails, and a doctor if you have nail plate changes.**

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