



# Chronic wounds can heal

## Practical information for wound treatment



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Dear readers!

Chronic wounds heal poorly or very slowly. For the person affected they are often connected with pains and intense stress which can prolong for a long period.

Approximately 4 million people in Germany suffer from chronic wounds. The most frequent types of wounds include the pressure sore (decubital ulcer), the lower leg sore (also called leg ulcer (Ulcus cruris) and "ulcerated leg") and the diabetic foot syndrome.

The treatment of such wounds has changed considerably in recent years – in fact very successfully: wounds are kept moist with new and modern dressing materials, thus supporting natural healing processes.

In this brochure we would like to inform you and your relatives comprehensively: What causes chronic wounds and how can you recognize them? How does a physician diagnose a wound and what is its proper treatment? Above all we would like to give you some practical tips for prevention and care. The aim of the brochure is to extend the interested reader's knowledge of the topic of wound healing / wound treatment and to provide extensive information. Thanks to the classification of the sections into "Chronic wounds: Prevention – Occurrence – Treatment", the person affected can specifically select relevant passages of the text.

Yours sincerely,

PAUL HARTMANN AG

# Chronic wounds – what are they actually?

One of the consequences of increasing life expectancies in the population is the distinctive increase in chronic diseases which also include chronic wounds. Their occurrence is promoted by the presence of different system diseases such as diabetes mellitus and other metabolic diseases, arteriosclerosis, cardiovascular diseases in conjunction with blood circulation insufficiency of the skin, leukaemia etc. Defect wounds of the skin which do not heal within six to eight weeks are considered to be chronic. Skin ulcers with loss of entire skin layers are typical examples of chronic wounds.

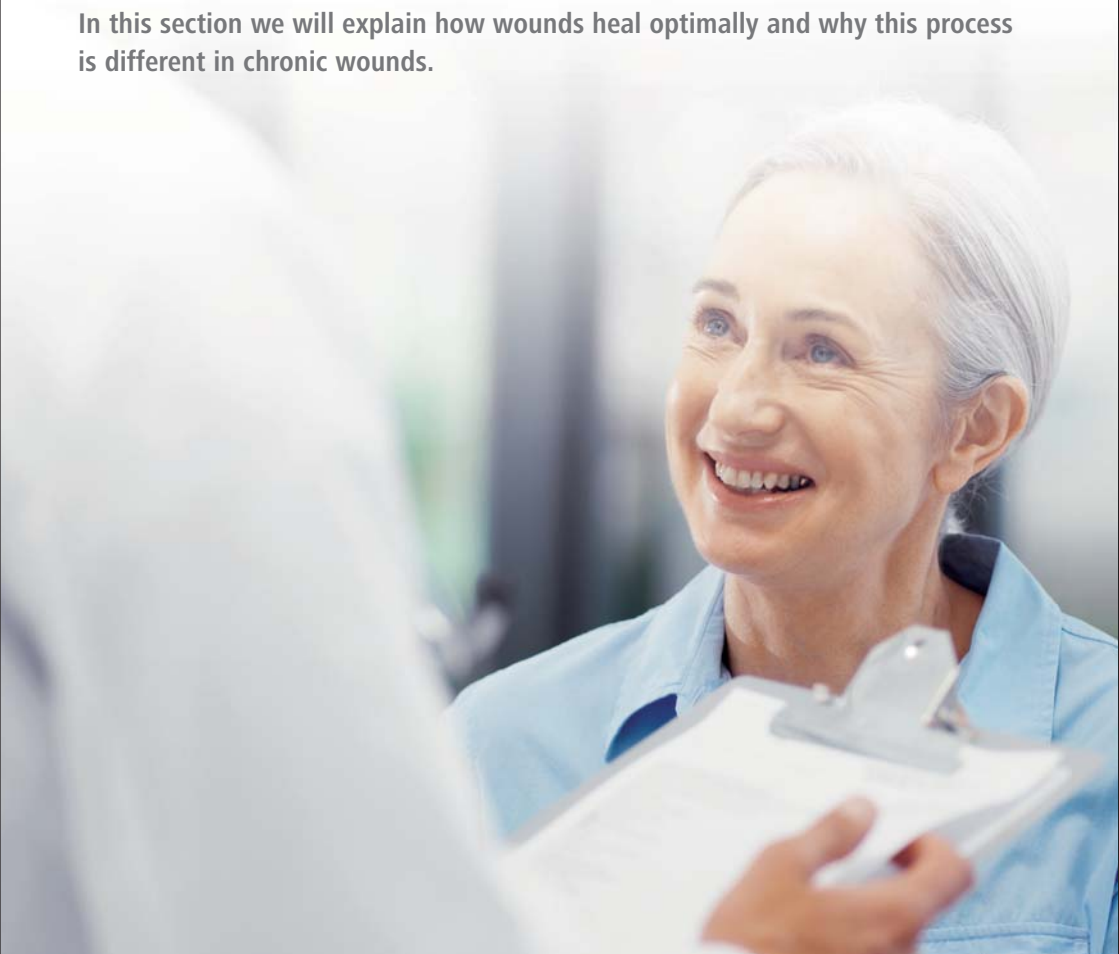
In this section we will explain how wounds heal optimally and why this process is different in chronic wounds.

“It will heal up soon.” Children who have hurt themselves are often comforted with these words. And that is true for most injuries because our tissue and our skin have the wonderful ability to regenerate themselves.

However chronic wounds are different, more problematical. Unlike acute wounds, they exist for a longer period and heal only very slowly. Therefore they are described with the term “chronic” which is derived from the Greek word “chronos”, for “time”. A chronic wound is also called a sore or an “ulcer” in medical language.

It is not caused by externally inflicted injuries such as a cut or a burn. In fact chronic problematic wounds are caused by certain diseases or influences on the body which bring about severe disturbed blood circulation in the skin. The skin is undersupplied and the affected tissue dies. A wound occurs as a visible result of this process. At the same time, insufficient supply of the tissue prevents the wound from healing.

According to estimates approximately 4 million people in Germany suffer from chronic wounds. Elderly persons are especially affected by this.



### When is a wound referred to as chronic?

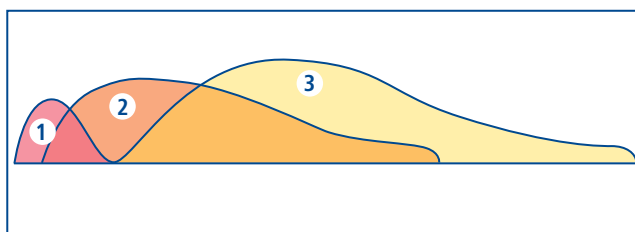
A normal injury takes about six to eight weeks to heal. Physicians categorize a wound as chronic when a tendency toward healing is not recognizable beyond this period. Skin ulcers are typical examples of chronic wounds.

To understand why a wound will not heal, it is helpful to know the healthy healing process. Therefore, we will now take a look at the skin as the “scene of action” and explain the stages of a normal healing process. Because even a chronic wound should be enabled to heal again.

### How does the healing process of the skin take place?

#### The normal healing process

Usually we can define three wound-healing stages:



Schematic representation of the temporal course of the wound-healing stages

Irrespective of the type of wound and the extent of tissue loss, the wound-healing process takes place in three dynamic stages. This healing process is disturbed in chronic wounds. Healthy tissue cannot regenerate due to the undersupply of the affected site of the body.

#### 1. Cleansing stage

Initially bleeding stops during the so-called wound cleansing stage. White blood corpuscles can migrate more easily into the wound area due to vascular dilatation and because the vascular walls become more pervious. It is their task to defend against infection and to cleanse the wound. In addition to this, inflammatory reactions can occur which the body uses to control the different pathogenic causes.

#### 2. Granulation stage (tissue formation)

Tissue regenerates during a complex process (granulation). The wound is filled from the inside. However because the tissue is not very resistant to mechanical loads, wound dressings at this stage must be changed carefully so that the new tissue is not damaged again.

#### 3. Epithelization stage (epidermization)

Wound healing is completed in the following epithelization stage. The original functions of the skin are restored with the regenerative tissue. Build-ups of similar cells (epithelial cells) regenerate from the margins of the wound and attempt to close the wound. If the surface layers dry out in this wound-healing stage, cell regeneration and thus healing can be delayed.

# What are the most frequent chronic wounds and how do they occur?

The treatment of chronic wounds is often a persistent problem for the patient and the relatives as well as for the medical staff. Chronic wounds are promoted by the presence of different organic diseases which already exist before the occurrence of the wound.

Chronic wounds are caused for instance by a constant weakness of the veins (chronic venous insufficiency – CVI), by arterial diseases in marginal areas of the body due to constriction and occlusion (peripheral arterial occlusive disease – PAOD), by diabetes (diabetes mellitus) or by a constant local application of pressure (decubitus).



A poorly healing, chronic wound is often a sign of an existing underlying disease. Unlike acute wounds, chronic wounds (ulcers) occur when blood circulation in the tissue is disturbed. Subsequently a disturbance of the nutrition occurs, the skin cells die and necrotic, i.e. dead tissue forms. Chronic wounds can only heal permanently when the disturbance which caused the wound is diagnosed and eliminated. For example in case of an ulcerated leg caused by a venous disorder (Ulcus cruris venosum / venous leg ulcer), not only the wound but also the venous high blood pressure must be treated by means of compression treatment.

#### The most frequent causes of chronic wounds are:

- Chronic venous disturbed blood circulation of the legs (chronic venous insufficiency – CVI)
- Peripheral arterial occlusive disease (PAOD)
- Chronic pressure loading
- Diabetes mellitus (with vascular and nervous lesions)

#### Chronic problematic wounds include:

- Pressure sore (decubitus / decubital ulcer / bedsores) due to the application of pressure, swelling of the skin, chafing or local inadequate blood circulation
- Lower leg sore (“ulcerated leg”, Ulcus cruris) due to local, venous or arterial disturbed blood circulation
- Diabetic foot (diabetic foot syndrome) due to foot injuries in patients with diabetes mellitus

Approximately 40 percent of all problematic wounds are pressure sores (commonly called "bedsores"). They occur mainly as a result of constant application of pressure on the skin.

### Pressure sore (decubitus)

Even the name of this type of wound as well as the term "bedsores" allude to the most frequent cause of a pressure sore: prolonged lying. The medical term decubitus also has the same meaning: "to lie down".

Pressure points and pressure sores develop very easily over bony prominences because the subcutaneous fat tissue has an only slightly padding effect e.g. on the coccyx, on thigh and hip bones, heels or malleoli. The ears, the back of the head, the shoulder blades and the toes can also be affected.

#### How does a pressure sore occur?

Basically a pressure sore is a chronic wound which can almost always be prevented. Due to the constant pressure on a certain part of the body, blood cannot flow freely any more. The tissue is no longer supplied sufficiently with nutrients and oxygen. It dies slowly. Depending on where the pressure is applied on the skin, a decubitus can develop at any site on the body.



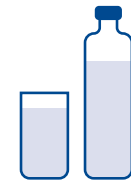
Because the duration of the application of pressure plays a decisive role in the development of a decubitus ulcer, the risk increases according to the degree of immobility of the person affected. First visible sign is a sharply defined skin reddening of closed, intact skin. In the further course the visible sign of this slow process is an open wound: cell death has reached the uppermost skin layer.

#### Risk factors which can lead to a pressure sore or can promote the occurrence of a pressure sore

Partially immobilized people with a weakened general condition of health may suffer especially from a pressure sore.

#### Age

Elderly people possibly in need of care belong to the largest risk group for a pressure sore. Their general physical condition is frequently reduced by other underlying diseases. They move less than younger persons and their skin exhibits changes which bring about greater vulnerability. Elderly persons frequently have an unbalanced diet or do not consume enough fluids, that leads to a deficiency in the body which has a negative effect on blood circulation and healing processes.



The wound healing process is delayed primarily by too little fluid.

The following factors have a single or combined effect:

#### Immobility

Restriction of mobility is not necessarily a result of ageing but can also exist due to a physical handicap, an operation or a stroke.

#### Incontinence

The medical term "incontinence" refers to the loss of the ability to consciously retain urine or faeces and to choose the time period of emptying. Even if the person affected is properly supplied with appropriate incontinence products, faeces, urine and bacteria can damage the skin.

#### Disturbed pain sensation

A healthy person feels an unpleasant pressure on the skin and changes his position. However persons with a disturbed physical sensation do not perceive such a pain and cannot react to it either by changing their position.



#### Body weight

Over- or underweight can promote the occurrence of a pressure sore when mobility is restricted.

#### Malnutrition

Malnutrition leads to a reduced general condition of health, weariness, exhaustion and weakness. Insufficient amounts of protein, vitamins and minerals and particularly too little fluid also delay the wound healing process.

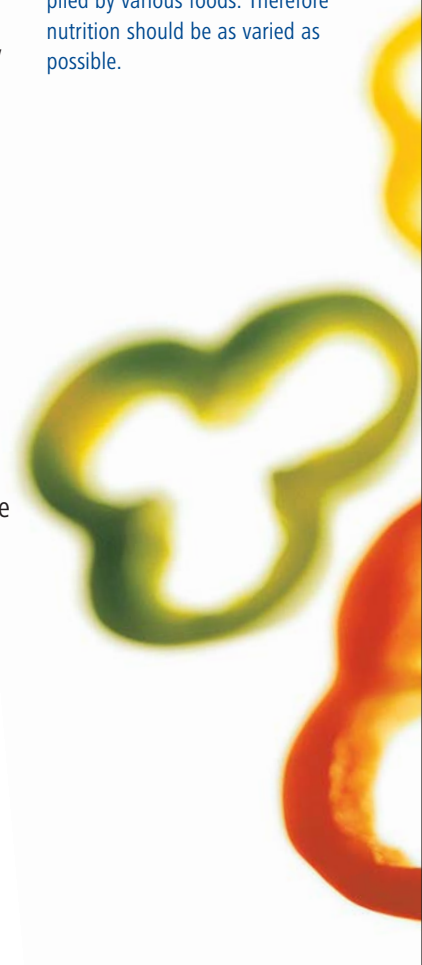
#### Wrong body care

The skin can only fulfil its diverse protective functions if it is healthy and elastic and the skin surface is intact. Therefore the use of suitable products for cleansing and care as well as for the protection of damaged or jeopardized skin is extremely important.

#### Further risk factors

Diseases with disturbed blood circulation and metabolic disturbances as well as various skin diseases can promote the formation of decubitus. Dry, cracked skin can also promote skin infections with bacteria and fungi and thus support the occurrence of a decubital ulcer.

The human body requires many different nutrients which are supplied by various foods. Therefore nutrition should be as varied as possible.



Over 1.2 million people in Germany suffer from an "ulcerated leg". Mostly they are elderly persons age 70 and older. Women suffer more often than men.

### The "ulcerated leg" or lower leg sore

There are several common names for this type of chronic wound: lower leg, leg or foot sore. A physician will refer to it as leg ulcer (Ulcus cruris).

For simplification leg ulcers (Ulcus cruris) are divided into three different main groups: venous leg ulcers (Ulcus cruris venosum), arterial leg ulcers (Ulcus cruris arteriosum) and leg ulcers (Ulcus cruris) in skin diseases.

Depending on its cause, a lower leg sore mostly appears in the malleoli area and frequently on the inside there. It can however occur on the entire lower leg. It forms on feet, toes or the heel more rarely.



Typical leg sore

#### What causes an "ulcerated leg"?

Vascular weaknesses are distinguished as venous or arterial depending on the vessel type – whether it leads to the heart or away from it. A physician will refer to it as a venous or arterial insufficiency. The corresponding sore is called a venous leg ulcer (Ulcus cruris venosum) or arterial leg ulcer (Ulcus cruris arteriosum) in medical terminology.

#### The venous vascular weakness

The veins have to transport large quantities of blood from the legs back to the heart every day. They are compressed by the calf muscles among other things: the blood is pumped back to the heart through the veins. To prevent the blood from flowing back, the veins are equipped with valves. They ensure a flow direction towards the heart (see illustration 1 and 2).

If the pump effect of the veins is weakened and the valves do not close tightly (see illustration 3), congestion occurs in the veins which in turn dilate. The skin is affected by local disturbed blood circulation which ultimately leads to the formation of a venous leg ulcer (Ulcus cruris venosum).



Blood clots (thrombosis) in deep-seated leg and pelvic veins can also be responsible for congestion in the veins.

A venous disease underlies approximately 80 percent of all leg sores. "Ulcerated legs" are caused by a pathological weakness of the blood vessels.

Leg sores caused by arterial weakness have distinctly increased in recent years

The backup presses water and protein particles into the surrounding tissue, causing the leg to swell (oedema). A vicious circle of further pressure increase and fluid build-up begins. The little ramified red veins which supply the surrounding tissue including the skin are slowly destroyed. Metabolism is disturbed. The tissue dies gradually and the surrounding area becomes inflamed. Typical brownish discolouration of the skin occurs. This process continues until the skin as the uppermost layer of tissue is affected.

#### The arterial weakness

The reason for an insufficient supply of the tissue is "arterial sclerosis" (arteriosclerosis). The constriction of arteries causes severely disturbed blood circulation in the legs and forces the persons affected to take frequent breaks while walking. Therefore this arterial occlusive disease is also referred to as window shopper's disease. If the tissue is so severely damaged, wounds occur. This is also referred to as gangrene.

#### The mixture of venous and arterial vascular weakness

It is very rare that persons suffer from a venous as well as an arterial vascular weakness. Physicians refer to such a sore caused in this manner as an arterial-venous leg ulcer (Ulcus cruris mixtum).

#### Other causal diseases

Only approx. 4 percent of lower leg sores are attributable to other diseases such as special blood or skin diseases, lymphatic oedema or malignant tumours.

#### Injuries

A lower leg sore usually forms from the inside. However it can also be triggered by an external injury on a weakened site of the leg. Particularly in case of arterial diseases it is therefore necessary to ensure that no pressure points or skin abrasions are caused by uncomfortable shoes.

#### Risk factors which can trigger a lower leg sore

As described, an "ulcerated leg" is mostly caused by venous and arterial vascular weakness. There is however a number of other factors which have a negative effect on blood circulation.

#### Women are more often affected than men

Vascular weaknesses can be induced by hormones. That's the reason why women suffer more often from an "ulcerated leg" than men.



Today more than 4 million diabetic persons live in Germany. One third to one fourth of the population lives with the risk of getting a chronic wound on their feet. These are about 1.25 million people.

### Lifestyle

The fact that lower leg sores occur so frequently nowadays can be explained by increasingly unhealthy lifestyles: smoking, overweight and high blood lipid levels, lack of exercise due to purely sedentary or standing work as well as unbalanced nutrition are often responsible for this.

### Genetic disposition

The disposition to a vascular weakness can also be inherited. If similar diseases in your parents or other relatives are known, exact observation of your legs and a preventative, healthy lifestyle are required.

### The diabetic foot

Chronic wounds on the foot are designated as diabetic foot syndromes which are caused by diabetes.

Diabetes can often cause disturbed blood circulation and/or damage to the nerves in the feet if it is diagnosed too late or is not treated correctly. Even a small injury (lesion) or a pressure point is enough to cause a poorly-healing wound.



### How does a diabetic foot develop?

In diabetic persons the metabolism is frequently disturbed by the high blood-sugar level. Thus nervous lesions (neuropathy) and disturbed blood circulation in the feet are typical secondary diseases. They involve the risk that even tiny injuries on the feet of the person affected are not perceived any more, do not heal any more and develop into ulcers.

Damage to nerve fibres initially means a reduction of sensitivity. Touches, pressure, pains, temperature and vibration are not perceived sufficiently any more. Thus the loss of protective perception of pain and pressure is one of the basic causes of foot complications in diabetic persons.

One of the most effective methods for preventing diabetic foot complications is regular examination of the feet for possible injuries.

In our part of the world, the occurrence of diabetic foot lesions is very frequently induced by injuries caused by shoes. Injuries due to wrong foot and nail care can also be the cause. Diabetic foot lesions can develop from minor injuries on the feet. If the worst comes to the worst, these causes can even lead to amputations.

In 45% of the cases only a nervous lesion is responsible for a diabetic foot. In further 45% of the cases the combination of a damage to the nerve and disturbed blood circulation are responsible for a diabetic foot and only in 7% of the cases a diabetic foot is solely caused by disturbances of blood circulation.



Foot lesions in diabetic persons are caused by unsuitable shoes in up to 55% of the cases.

#### Risk factors which may lead to a diabetic foot

The greatest risk of contracting a diabetic foot is due to the fact that the injuries on the feet are often diagnosed too late. The persons affected hardly feel the pressure points and pains and frequently do not notice calluses and minor haemorrhages.

Therefore particularly diabetic persons must pay special attention to their feet: even small abrasions or pressure points can be the beginning of a chronic wound development.

Pay special attention to shoes. Uncomfortable shoes cause pressure points which are possibly not noticed and can become problematic wounds.



If there was a foot injury in the past, the risk of contracting a diabetic foot increases.

You can do a lot to reduce the risk of contracting diabetic foot syndrome. You can substantially reduce the risk of diabetic ulcer by proper blood-sugar adjustment, special patient training and regular inspection of your feet.

#### What are the possible consequences of unhealed wounds?

Unfortunately the case arises again and again that a chronic wound will not heal any more. The reasons can be varied, the consequences are frequently dramatic.

#### Skin graft

If a wound is too large to heal on its own, a transplantation of the body's own or cultured tissue is possible.

#### Amputation

Depending on the severity of the damage it may be necessary to remove dead tissue and even to amputate the affected areas.

## How are chronic wounds diagnosed correctly and in sufficient time?

The earlier a chronic wound is diagnosed the better the chances of healing. Therefore it is important that the person affected interprets the initial signs correctly and obtains medical assistance at an early stage.

In addition to assessment and diagnosis, your physician will try to determine the underlying causes as well. Only this way the physician can start a suitable treatment.



An experienced physician can easily identify a chronic wound. The depth of the wound, coatings, exuding fluids and signs of inflammation also indicate the stage of the wound.

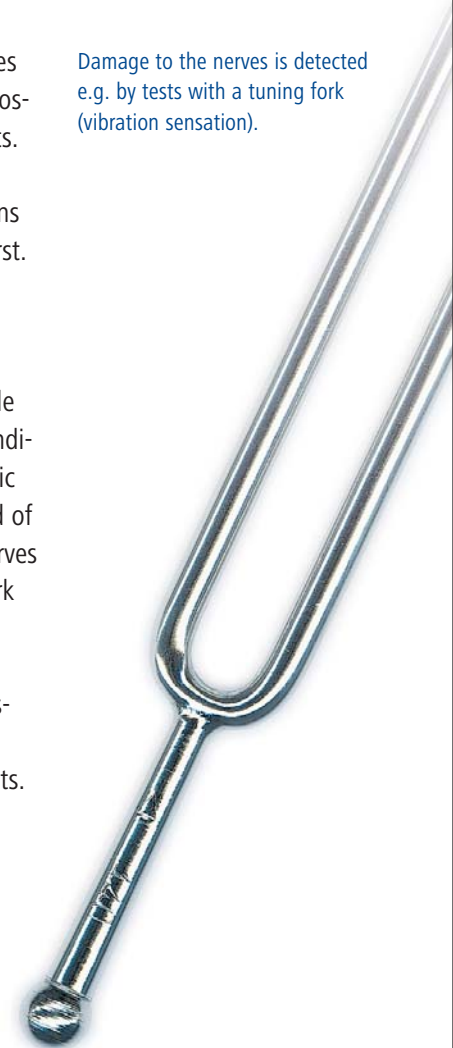
For the physician complete diagnosis of the ulcer includes asking for the case history. This allows him to find out possible causes such as diabetes before he does further tests.

Furthermore he will check the blood circulation conditions of the veins and arteries. The foot pulse can be felt at first. If it is not perceptible, this is an indication of disturbed arterial blood circulation.

Technical equipment provides more information: a double sonography which shows the exact blood circulation condition of the veins and arteries is created with an ultrasonic device. Possible thrombosis can be depicted with the aid of contrast radiography (phlebography). Damage to the nerves is detected by tests with a reflex hammer or a tuning fork (vibration sensation).

A blood count can provide precise information about disease causes such as diabetes. The causes of a chronic wound can be exactly determined by these measurements.

Damage to the nerves is detected e.g. by tests with a tuning fork (vibration sensation).





### Initial signs of a pressure sore

Skin changes are the only reliable indication of beginning ulcers. Therefore checking the skin daily for the following symptoms is urgently recommended:

An area of the skin which is constantly exposed to pressure shows well-defined reddish discolouration. Even after pressure relief this reddening continues to exist for at least 2 to 3 minutes. If the skin is slightly injured or blisters are visible, this is a clear alarm signal.

It must be kept in mind that a person suffering from a sensitivity disturbance often feels little or no pain.

### Initial indication of a lower leg sore

Before an open chronic wound develops, e.g. skin swelling appears on the inside of the malleoli, so-called oedemas, in case of venous vascular weakness. It occurs due to accumulation of water in the tissue. The skin turns brownish-yellow. "Stasis eczema" often forms; it appears as itchy, inflamed areas.

The person affected feels the congestion in the leg as pressure which increases towards the evening. He feels relief when he props up his leg. Pains are not felt.

This is different with an arterial weakness. It is accompanied by severe pains. When walking the person affected has to stop and take a break again and again ("window shopper's disease"). The feet and legs are often cold and pale which is an indication of a blood circulation insufficiency of the feet.

In case of this sign it is necessary to beware of minor injuries. They can be enough to contract an ulcer because even tiny wounds cannot heal any more.

### What diabetic persons should bear in mind

As a diabetic person you should observe your feet very sensitively. Test your sensations yourself. Do you feel pressure, cold or heat? Do your feet feel numb? Do you perhaps walk unsteadily? These are all signs of a nervous disturbance. Or do you suffer from cold feet and a thin, pale skin which has a bluish discolouration particularly on your toes and margins of the feet? Do your toenails grow very slowly? Then presumably blood circulation is disturbed.

If some of these signs exist, this does not necessarily mean that a chronic wound will occur. But even small abrasions, pressure points or cornified skin formations can rapidly grow to an ulcer. [In these cases do not hesitate to go and see a physician.](#)

# How can chronic wounds be prevented?

The best strategy in dealing with chronic wounds is prevention. Because in many cases a chronic wound can be prevented - to the great relief of the person affected. The measures described in the following section may be very helpful.



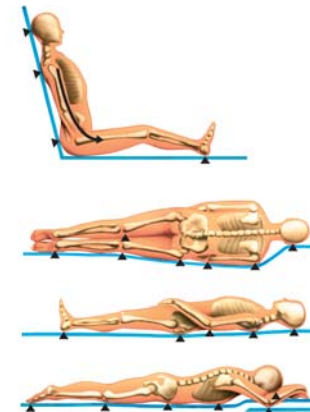
## Measures taken in order to prevent a pressure sore (decubitus, decubital ulcer)

A pressure sore is a source of immense stress for the person affected. He suffers severe pains and must frequently undergo long treatment. Therefore it is better pressure sores do not occur at all. They can frequently be avoided through preventative measures. One main measure is pressure relief. It can be achieved through appropriate positioning. It is also important, however, to promote the mobility of the person affected to prevent further reductions.

### Correct positioning is extremely important

It is essential that bedridden persons who cannot move are repositioned at an interval of at least two hours.

Especially parts of the body over bony prominences which are only slightly padded with muscular or subcutaneous fat tissue must be relieved again and again: for example the region around the coccyx and hip, the back of the head, the ears and the shoulders as well as the elbow, heels and the malleoli. This is the only way to stimulate blood circulation and prevent tissue destruction.



The body areas where pressure sores (decubital ulcers) frequently occur: primarily a pressure sore occurs on sites over bony prominences which are only slightly padded with muscular or subcutaneous fat tissue.

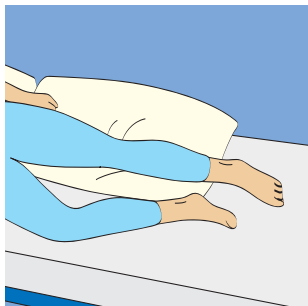
During this so-called repositioning you must make sure that the skin does not rub against or “stick” to the bed sheet. Catheters or probes which can constantly stress the skin at certain parts of the body must also be positioned so that they exert as little pressure as possible on the skin. Therefore preventative repositioning requires expertise in order not to do harm indirectly.



Weight can also be shifted by smaller repositionings such as changing the position of an arm from the side onto the stomach.

#### Free or soft positioning

A tried and tested method of keeping jeopardized regions such as at the heels away from the underlying surface is to place padding under the lower leg over a large area (increasing contact surface = reducing pressure).



If this cannot be done such as at the coccyx, it is possible to distribute the pressure. Special positioning pillows and mattresses which are very flexible (thanks to many air chambers) are available. The distribution of weight can be constantly re-adjusted with them. Individual requirements are met by the different models. However, the use of such mattresses does not replace repositioning!

30 degree positioning



#### Promote mental and physical movement

The simplest possibility of pressure relief is movement. If the person affected cannot move well any more or is confined to bed, carers, relatives and therapists must try to mobilize him and promote his mobility. Effective prevention can be achieved through simple measures such as sitting up on the edge of the bed, walking with support or simple gymnastic exercises. An appropriate physiotherapy can provide instruction and further tips.

Mental occupation is also important for the person affected. Conversations, watching TV, reading the newspaper, hobbies etc. promote mental and also physical fitness. If the person affected cannot read or watch TV any more, you should read to him or offer radio programmes.

Conversations, watching TV, reading the newspaper, hobbies etc. promote mental and also physical fitness





### Prevention in the case of disturbed venous or arterial blood circulation in the legs

Healthy nutrition is essential, as is often the case: vitamins, dietary fibres and low fat intake help to maintain a normal body weight.

Drink a lot – water is best – that promotes blood circulation.

Do not wear any shoes which pinch or have high heels or stockings which cut in. In any case pressure points must be prevented

If you are affected by disturbed arterial or venous blood circulation, only one thing will help directly: promote blood circulation in the legs.

Make sure you get plenty of exercise. Use the stairs more often instead of taking the lift. Go for a walk regularly and engage in sports. If you are forced to sit or stand at your workplace for long periods, change your position more frequently. Swing your feet in a circle once in a while.

Do not sit with your legs crossed. Otherwise the blood flow is impeded even more.

Very important: If you smoke, you should really stop, because it is poison for your vessels!

#### Compression stockings

Compression stockings have also proven to be effective in case of venous weakness. They should be prescribed by a physician and exactly fitted.



### Prophylactic recommendations for diabetic persons

If you suffer from diabetes, you should pay a lot of attention to your feet. This is especially true when sensation in your feet is limited.

#### Trainings for persons affected

Furthermore diabetic persons should attend special patient training seminars where they are informed about the hazard to their feet and learn about the right foot care. Here you will also learn how to look at your feet daily and to detect wounds or infections at an early stage.

#### Regular control by the physician

Your physician should regularly examine your feet. He will also feel your pulse to check blood circulation. The sensation of the feet is also tested. Vibration sensation is tested with a tuning fork and a reflex hammer. Heat and cold sensation should also be checked regularly.

#### Daily self-examination

You should look at your feet and check them for injuries and pressure points daily. Always remember: even if you do not feel anything, you could have hurt yourself! A little mirror can help you to examine the soles of your feet as well.



Don't be afraid of having your feet examined by a close friend daily! It is extremely important that you notice a change or injury immediately and then see a physician promptly.

#### Care of the feet

If you are not able to take care of your feet every day, do not hesitate to get some help! Trained nursing staff is available, and even relatives can learn how to provide professional care.

Daily foot care includes a short footbath. The water doesn't need any additives, only a very mild soap at the most. The water should be at body temperature and should not exceed 37° C. If your sensation is limited, check the temperature with a thermometer to prevent scalding accidents on your feet.

Wash your feet thoroughly between the toes. This takes just a few minutes. Because the skin is very sensitive and must not dry out any further. Therefore the feet must be dried well and carefully – especially between the toes. But do not rub the skin. And most importantly: Put a suitable care cream on your feet so that the skin retains its moisture and remains supple. That way you will prevent dehydration and dangerous cracks.

Use a file and not nail scissors or clippers to shorten the nails. If a pedicurist helps you, make sure she/he has been trained to treat diabetic foot.

If you notice corns or warts, do not remove them yourself! Get professional treatment.

#### Warm and dry feet

Wear wool or cotton stockings and not ones made of synthetic material. That way you will ensure a balanced climate in the foot area. Stockings should not be darned because thicker areas can easily lead to pressure points. Change your stockings daily, turn the stockings or socks inside out so that the seams are pointing outwards and cannot cause any pressure points. If you tend to have cold feet in bed, put on bed socks. Hot water bottles pose a risk of overheating or burns – which you might not notice at all.

#### Suitable shoes

Make sure you wear good, comfortable shoes made of natural materials. They must not pinch or rub. And they should be well made, i.e. smooth on the inside so that no pressure points can occur. Your foot should fit firmly and comfortably in the shoe. Another tip: Go shoe shopping in the early afternoon because then your foot is not too constricted or too swollen but has its average size. Then a shoe should fit exactly.

If your feet have defective positions or deformations, get a prescription for orthopaedic shoes.

It is important to remove horny skin regularly. Please do not use a corn parer for this because it is so sharp that you can cut yourself with it. You can easily remove horny skin with a natural pumice stone during regular care – without the risk of hurting yourself.



Ready-made special shoes are just as important for diabetic persons as professional foot care.

## How are chronic wounds and ulcers treated?

There are many reasons why a patient's general as well as special medical conditions can influence wound healing. As long as they are not diagnosed and taken into account, the patient will hardly experience optimum wound healing.

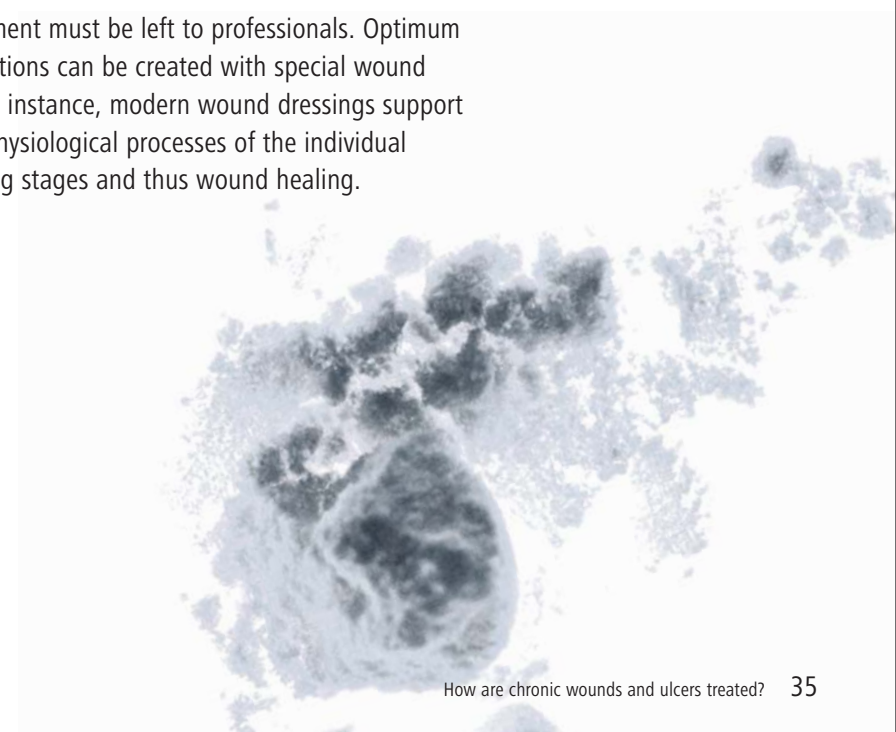
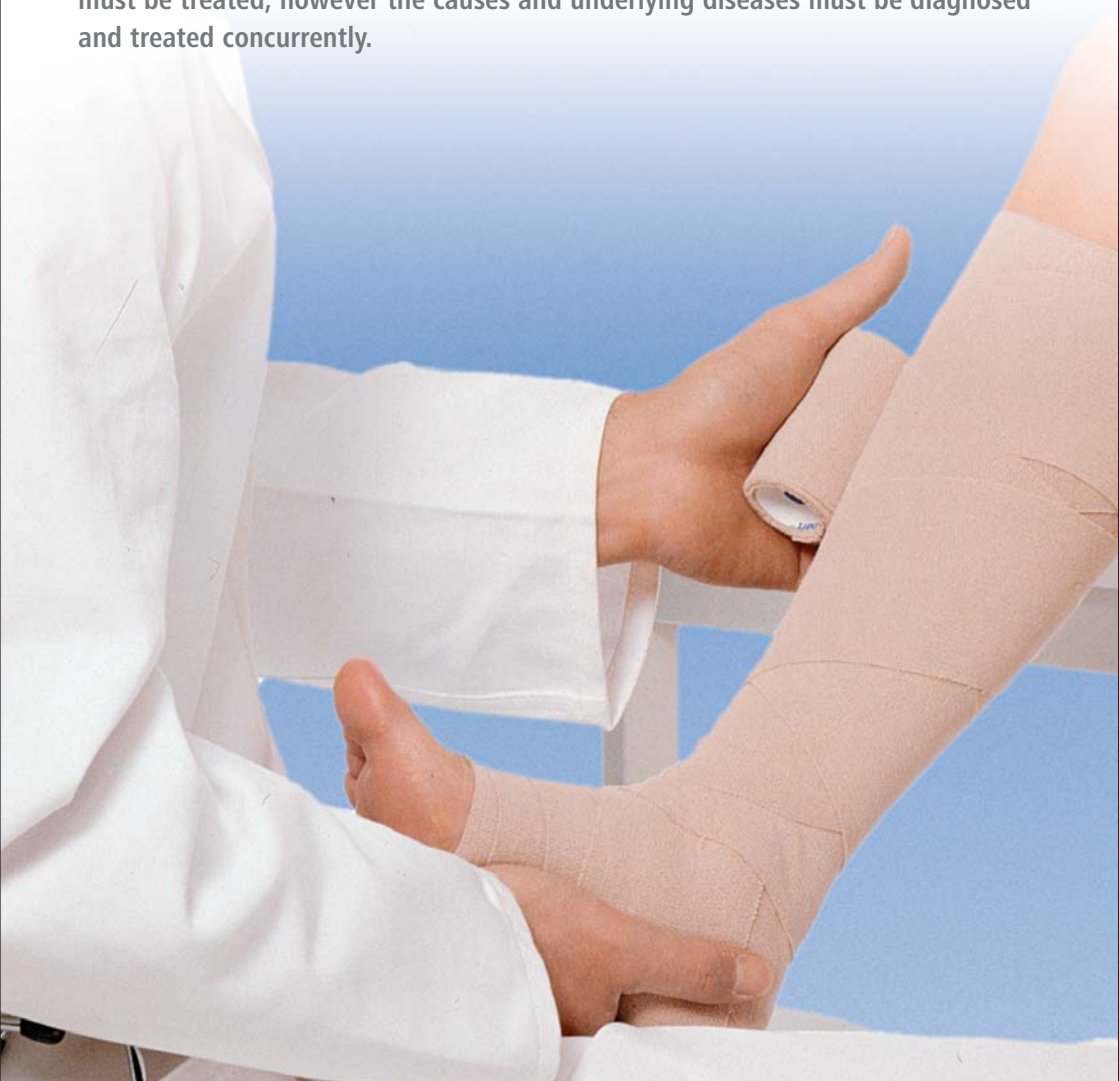
The treatment of a chronic wound consists of two parts: first of all, the wound must be treated; however the causes and underlying diseases must be diagnosed and treated concurrently.

In recent years the treatment approaches for problematic wounds have changed considerably: While keeping the wound dry was still considered to be the correct procedure several years ago, it is known today that this procedure slows down or possibly even disturbs wound healing.

Today a chronic wound is kept moist with special dressings in order to support the body's own healing processes. Thus a condition is created in which tissue and vessels can regenerate again.

Powders, so-called vulnerary consolidants, dyes such as gentian violet or even local antibiotics are not put on open wounds any more today.

Wound treatment must be left to professionals. Optimum healing conditions can be created with special wound dressings. For instance, modern wound dressings support the specific physiological processes of the individual wound-healing stages and thus wound healing.



### What should be kept in mind during dressing changes?

The first step in wound treatment consists of cleansing the wound and removing coatings and dead tissue (debridement).

This is carried out with the aid of surgical instruments like a scalpel, scissors, a sharp curette or laser. All local wound healing-inhibiting factors are thoroughly removed out of the wound. Apart from the so-called surgical debridement also other methods can be used: e.g. the autolytic debridement, the enzymatic debridement and wound cleansing by water pressure or by ultrasonic device.

In certain cases of chronic and infected problematic wounds, sterile maggots can be used for cleansing as biological debridement. Inflamed and dead tissue is removed but not the healthy one.

If the wound must be cleansed during a dressing change, the method of choice is careful dabbing with gauze swabs or rinsing with Ringer's solution (TenderWet® solution). It is also possible to use non-cytotoxic antiseptics for rinsing during dressing changes in order to cleanse the wound.

It is important that these measures are carried out under germ-free conditions. An infection must be prevented in any case.



At every dressing change, the nurse observes the condition of the wound exactly and documents changes: Notes are made concerning size, depth and colour of the wound. Are there any coatings, dead tissue (necrosis) or secretion? Is tissue regenerating (red granulation) or is new skin forming (epithelization)? What healing stage is the wound in? That way it is possible to track the progress of wound closure and notice possible complications immediately.

If an infection of the wound is suspected, a smear is made from the wound which provides information about the possible causes. If there is an infection, it must be treated systematically, e.g. by systemic administration of antibiotics.

After wound cleansing a "hydroactive wound dressing" is applied. These special dressings keep the wound moist, warm, clean and mechanically protected. In addition they are frequently transparent and facilitate observation of the wound.



The compression bandage or the medical compression stocking can still be worn after the wound has healed in order to prevent new formation of the wound.

### Why is it so important to consider the underlying diseases of problematic wounds?

Many problematic wounds are caused by underlying diseases like diabetes mellitus or disturbed blood circulation. They induce lower leg sores or diabetic foot syndrome and also impede their healing. Therefore it is important to diagnose and to treat these underlying diseases. This is the only way to promote the wound healing process and prevent new wounds.

#### Venous and arterial disturbed blood circulation

In case of venous lower leg sores the best wound treatment is useless if the venous weakness is not treated at the same time. Good results are usually achieved with a compression treatment with appropriate dressings. In addition the leg is elevated to support the backflow of blood. The persons affected should support blood circulation by walking or performing gymnastic exercises. The following basic rule applies: "Lying and walking are better than standing and sitting."

Arterial weakness is treated differently than venous weakness. The leg affected is lowered. If it is not possible to improve blood circulation with medication, a bypass operation is usually indicated. A constricted or blocked vascular section can be bridged with the aid of an artery or vein. Another possibility is surgical vascular dilatation to guarantee sufficient blood flow through the arteries again.



#### Diabetes mellitus

Diabetic foot lesions are frequently triggered by trivial injuries, unsuitable shoes or inadequate foot care. One of the most effective methods for preventing diabetic foot complications is regular examination of the feet. Concurrently it is necessary to control diabetes optimally to achieve blood-sugar values which are as normal as possible.

Regular blood-sugar checks at a physician's office and at home, appropriate diabetes training and the "right control" are important preconditions for the prevention of chronic wounds and continued well-being – despite diabetes.



## What modern dressing materials are suitable for the treatment of chronic wounds?

In the preceding sections we presented the principles of modern wound treatment. Today's wound dressings keep the wound moist, provide protection against external influences and actively support the healing process. They are made of highly effective materials and are used individually depending on the condition and healing stage of the wound.

High-quality products, like the PAUL HARTMANN AG products described in the following sections, guarantee reliable and therapeutically effective treatment for the management of problematic wounds as well as for compression therapy.

When dry treatment with medicated ointments (so-called vulnerary consolidants), powders or local antibiotics was still predominantly used for open wounds, dressing changes were frequently painful and newly formed tissue was removed in the process. **Today it is known that only a moist, warm wound condition optimally promotes the new formation of tissue and skin cells.** The success of wound treatment is however bound to a decisive precondition. The wound must constantly be kept moist to a balanced degree.

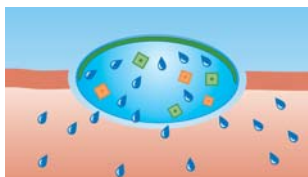
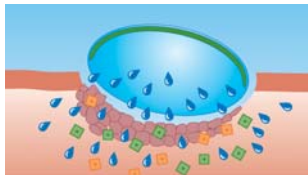
Modern foam dressings and hydroactive wound dressings which maintain a moist wound environment are especially adapted to the respective healing stage and the condition of the wound. That way they guarantee optimum wound healing.

To enable you to understand the effect and function of this modern wound treatment and your own treatment better, we will present different products in the following section. They are particularly suited for moist treatment of problematic wounds such as the lower leg sore, diabetic foot or decubitus.

All PAUL HARTMANN AG products are marked out by high wearing comfort, perfect fit, and good skin tolerability. Thanks to their high effectiveness and absorption capacity, dressing changes are required less frequently, thus guaranteeing economical wound treatment.

### Wound dressing pad with super absorber – TenderWet®

With the laminate dressings TenderWet an effective system is available which develops an automatic rinsing effect in the wound. It is a multilayer pad-shaped wound dressing which contains an absorbing and rinsing core made of superabsorbent polyacrylate. The non-medicated super absorber is activated before application with an isotonic, "physiological" salt solution (Ringer's solution / TenderWet solution) which is continuously delivered for hours. The constant supply of Ringer's solution, actively softens, detaches and rinses out dead tissue.



The mode of action of TenderWet

TenderWet is available in different sizes and in round and rectangular shapes. The classic TenderWet maintains its absorbing and rinsing effect for up to 12 hours. Dressing changes should therefore take place every 12 hours. For the fault-free activation of TenderWet (and as well as of TenderWet 24), TenderWet solution is available in ready-to-use sizes of 10, 15 and/or 30 ml.

TenderWet 24 consists of the same materials as TenderWet, but is structured so that the absorbing and rinsing effect is sustained for up to 24 hours. For simplified application, TenderWet and TenderWet 24 are available in pre-activated form as TenderWet active cavity and TenderWet 24 active. These "active" wound dressing pads are soaked with ready-to-use Ringer's solution and can be applied immediately.

### Calcium alginates – Sorbalgon® und Sorbalgon® T

Sorbalgon is a non-woven dressing, made of high-quality calcium alginate fibres which are extracted from the brown algae. Calcium alginates, like Sorbalgon or Sorbalgon T are placed into the wound in a dry state. The calcium ions in the alginate are replaced by sodium ions when they come into contact with the sodic wound secretion. In this manner the alginate becomes water-soluble and forms a moist, absorbent gel. Germs are bound in the gel. Adhesion to the wound as well as dehydration of the wound base is prevented.

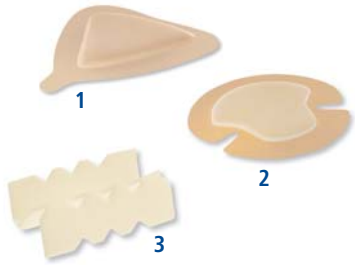
Calcium alginates are suitable for flat as well as deep wounds. Dressing changes also cause little pain. Alginates are available as dressings (Sorbalgon) as well as tamponing ribbons (Sorbalgon T).

In case of dry wound conditions the dressing must be soaked with a sterile fluid e.g. with TenderWet solution.

The HARTMANN calcium alginate product Sorbalgon is an ideal wound dressing for cleansing and for the formation of granulation (formation of new tissue) in fissured and relatively inaccessible wounds. Sorbalgon has an excellent draping capability and packing capability and thus provides for a healing-promoting wound environment even in the depth of the wound.



The mode of action of Sorbalgon



### Foam dressings – PermaFoam®

Especially for decubitus treatment PermaFoam is also available in different shapes designed for specific body areas:

- 1) PermaFoam sacral for the buttock area
- 2) PermaFoam concave for elbow and heel
- 3) PermaFoam cavity for packing deep wounds

Today finely foamed polyurethanes are increasingly used to implement the principle of moist wound treatment. They are wound dressings which absorb inflammatory wound fluid (exudate) without changing their size or shape. The porous foam dressings absorb large quantities of fluid by means of capillary strength.

The foam dressing PermaFoam is a combination of two differently structured foam materials, which are linked to one another by means of a special lamination. The absorbent layer of PermaFoam is made of hydrophilic material, which is able to store up to nine times their own weight of fluid. The top layer of PermaFoam is made of flexible, closed-pore polyurethane foam and is semi-permeable, i.e. impermeable to germs, but allows water vapour through. This type of wound dressing should only be used for moist wounds.



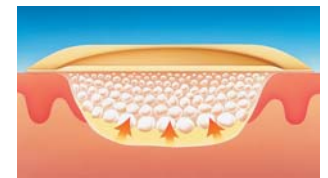
The basis of the therapeutic effectiveness of PermaFoam is the special pore structure: the large pores on the wound-facing side become ever smaller towards the top layer, which creates a large vertical capillary effect.

### Hydrocolloids – Hydrocoll®

Hydrocolloid dressings consist mostly of a thin plastic film or a foam material with a layer of swelling-capable, hydrophilic particles applied to it. By absorbing wound exudate these particles swell and transform into a gel which keeps the wound moist. Excessive exudate, cell debris, and germs can be removed with little pain at every dressing change. The external layer consists mostly of an impermeable to germs and waterproof polyurethane foil which protects the wound against external contamination and dirt and enables the performance of daily body care in a simple manner.

Hydrocolloids with particularly good absorbing and swelling capabilities are used for the hydrocolloid product Hydrocoll from HARTMANN. In the gel condition, they may be removed in one piece from the wound. Nearly no gel residues remain in the wound. This facilitates dressing changes.

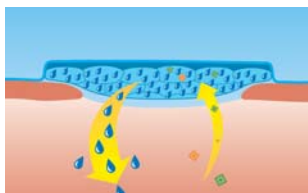
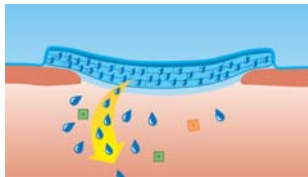
Hydrocoll is available in different shapes, e.g. as “concave” for the wound treatment to elbows and heels or as “sacral” for the treatment of ulcers and wounds. The rectangular standard version is also available in sizes suitable for small wounds. The “Hydrocoll thin” version is specifically used for wounds with less secretion in the epithelization stage.



The mode of action of Hydrocoll

## Hydrogels – Hydrosorb®, Hydrosorb® Gel

Hydrogels also have a two-layer design. A semi-permeable polyurethane foil serves as a barrier against germs, dirt and moisture from the outside. The second layer consists of 60% water. Compared with the hydrocolloids, hydrogels do not require any wound secretion to keep the wound moist. Thus they are a moist wound dressing from the start of treatment. Unlike the hydrocolloids the hydrogels do not form a gel; however they can also absorb wound secretion. Hydrogels can be taken off as a complete dressing; no residues remain on the wound. Their transparent properties also allow observation of the wound through the dressing even in case of a wearing duration lasting several days.



The mode of action of Hydrosorb

Hydrosorb is suitable for the treatment of dry, superficial or deep wounds and can moreover be used for softening and hydrogenating necrotic tissue. Hydrosorb is available in different shapes and presentations: Hydrosorb comfort with self-adhesive fixation border as well as Hydrosorb without adhesive border. Both hydrogels have the same physical principle but differ in their method of fixation. Additionally, the clear and viscous gel, Hydrosorb Gel, enables a simple and safe use for the management of most type of superficial and deep wounds and wounds of other geneses with slight exudation.

Hydrosorb comfort has a self-adhesive fixation border and is suitable for wounds which have a healthy wound site.

In contrast, Hydrosorb without fixation border is particularly suited for wounds with a poor condition of the surrounding skin. Permanent securing with bandages or tubular bandages is useful.

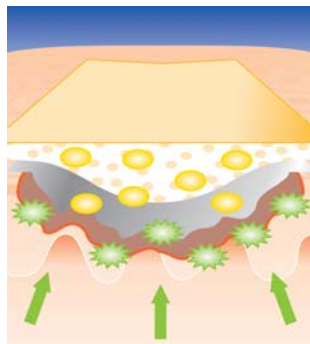
Hydrosorb Gel is a clear and viscous gel made of water with an electrolytic composition which immediately provides a balanced moist wound environment. Hydrosorb Gel softens dry, necrotic tissue and facilitates removal. Coatings and wound exudate of slightly exuding wounds are absorbed. Hydrosorb Gel is also able to dispense moisture into more or less dry surroundings.

Hydrosorb Gel can be combined with nearly all secondary wound dressings.

Hydrosorb Gel is available in syringes of 15 g. They are individually packed in protective covers and have two scales to calculate the amount of gel needed to fill the wound and of remaining gel to enable clinical wound documentation.



### The silver-containing ointment dressing with antibacterial properties – Atrauman®Ag



The mode of action of Atrauman Ag: bacteria (green) are killed on contact with Atrauman Ag. Killed bacteria and the produced toxins are absorbed with the wound secretion (yellow) into the wound dressing placed over Atrauman Ag

Atrauman Ag is a silver-containing ointment dressing with an antibacterial effect. The carrier material is impregnated with a neutral ointment mass which counteracts adhesion to the wound and protects the wound margins and keeps them soft and supple.

Like all other ointment dressings, Atrauman Ag is used in conjunction with an absorbent wound dressing.

Atrauman Ag does not cause sensitisation or allergies during long-term use either.

Atrauman Ag is used as a supplement in the treatment of germ-laden or infected wounds as well as for prophylaxis against infections.

### The ointment dressing with the hydrocolloid particles for moist wound treatment – Hydrotul®

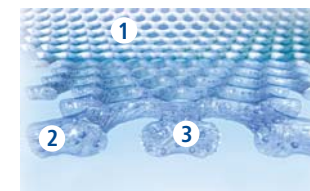
Hydrotul is a hydroactive ointment dressing made of hydrophobic, wide-meshed polyamide lattice tulle, which is impregnated with a non-medicated hydroactive ointment base. In the process of wound exudate absorption it is being converted into a water-in-oil emulsion. The hydrocolloid particles existing in the emulsion absorb and store wound moisture and form, together with the emulsion, a gel containing triglycerides. Hydrotul creates an optimum moist wound environment and keeps at the same time the wound margins soft and supple. Hydrotul is indicated for the topical treatment of acute or chronic wounds with friable, sensitive skin. Hydrotul is used in conjunction with an absorbent wound dressing.

#### Miscellaneous dressing materials

A conforming bandage is frequently applied to additionally protect the wound and the wound dressing from external influences. Its function is to prevent the wound dressing from slipping or becoming loose, to protect the wound against dirt and germs and to pad it against pressure and impacts. Therefore conforming bandages must fit firmly, smoothly and securely. At the same time the bandage must not be constricting.

Conforming bandages made of gauze or highly elastic polyamide, adhesive plasters, fixing foils as well as net tubular bandages and tubular bandages are easy to handle and do not require any complicated application techniques. Your treating physician will be happy to advise you.

Hydrotul: Tree-dimensional representation of the hydroactive ointment base.

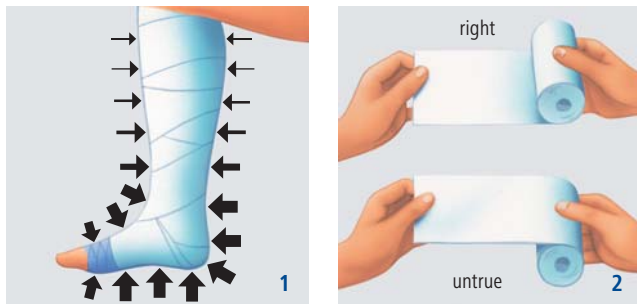


- 1 Honeycomb structure of the carrier matrix prevents accumulation of exudate
- 2 Hydrotul ointment keeps the wound margins soft and supple
- 3 Hydrocolloid particles keep the wound moist

### The right compression bandage for venous leg disorders

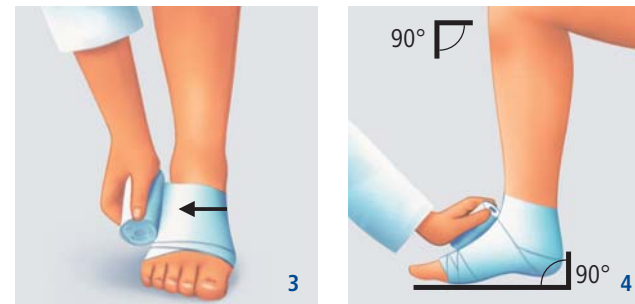
Disturbed blood circulation in the leg veins is the main cause of lower leg sores or an ulcerated leg. Therefore treatment of venous leg ulcer (Ulcus cruris venosum) is always accompanied by a compression treatment. Because compression of the leg brings about a substantial improvement of the venous blood flow. As a result, fluid build-ups and metabolic products can be removed more effectively again. Swelling recedes and the open ulceration can heal better because blood circulation in the wound area has also improved.

Bandages with different compression characteristics and diverse materials are available for treatment with compression bandages. Thanks to their diverse tension force/regain force characteristics they can optimally support the pressure conditions in the leg when it is resting or moving.



### Tips for the application of a compression bandage

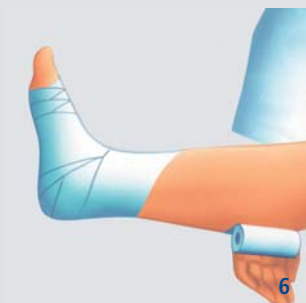
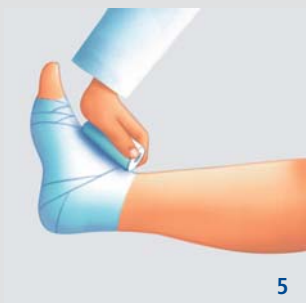
A good bandage must tightly surround the leg completely; it must not pinch or constrict uncomfortably anywhere. The pressure of the dressing should decrease evenly from the foot towards the knee (1). The bandage must be held properly in the hand (2) because only in this way can it be unwound on the leg (3). It should be kept in mind for compression bandages that the bandage must be adapted to the leg and not the leg to the bandage! Therefore the bandage may be unrolled directly on the skin only in the running direction. Never pull the bandage away from the leg so that no furrows are created. The foot must always be kept right-angled to apply the bandage (4). This prevents the bandage from slipping or creasing later. The bandage should be applied before rising if possible.



The so-called short-stretch conforming bandages whose extensibility is limited are particularly suited for compression treatment of venous leg disorders and for ulcer treatment



It is extremely important to select the right material which exerts the right pressure: Pütter bandage



### Application of a compression bandage

The bandaging technique shown here is a modified Pütter bandage with two counter-running short-stretch bandages. This technique ensures high stability and better durability of the bandage

The first turn of the bandage starts at the metatarso-phalangeal joints and runs outwards (1). When this is being done, the foot is kept at right angles.

After 2 – 3 turns of the bandage around the midfoot, the next turn covers the heel and comes back to the instep over the medial ankle (2).

With another two turns, the edges of the first turn are additionally fixed. First, the bandage runs over the upper edge around the ankle (3) and then over the lower edge at the arch of the foot (4).

After a further turn of the bandage around the midfoot, the bandage is taken back to the ankle across the ankle joint line (5), and then conforms to the leg, spirally in order to enclose the calf (6).



From the popliteal space, the bandage is brought back to the calf, and from there follows the shape of the leg back down (7), covering any gaps in the bandage.

The second bandage is counter-running applied towards the inside of the ankle (8), the first turn running over the heel to the back of the foot.

Two further turns fix first the upper (9) and then the lower edge of the heel wrap.

Finally, the bandage is wrapped once more around the midfoot and then spiralled upwards (10) and back down again in the same way as the first one. The completed bandage (11) is fixed.

A good bandage should tightly surround the leg on all sides; it should evenly decrease in pressure from the more distant leg areas to the areas closer to the centre of the body. The bandage should not pinch or constrict.

### What else must be considered during compression treatment?

You should support compression treatment with plenty of movement as far as possible. However if your mobility is limited or you spend a lot of time in a sitting or lying position, keep in mind that a sitting position is more disadvantageous than a lying position during compression treatment. Therefore you should change both positions regularly.

If you have a leg sore, you must wear the compression bandage until the leg affected is decongested and the wound has healed completely. Afterwards you should always wear an individually fitted compression stocking to prevent the recurrence of disturbed blood circulation and backflow disorders in your leg.

After successful oedema decongestion in the lower limbs with compression bandages, these are swapped for medical compression stockings.

Saphenamed ucv is a two-layer understocking-overstocking system made of soft, temperature regulating material with SeaCell®, a textile fibre enriched with seaweed to revitalise the skin. Consisting of an understocking with built-in donning aid and an overstocking, the two-layer system makes donning a breeze. The combined action of the two stockings makes for an optimum pressure gradient, high wearing comfort and easier donning. Saphenamed ucv is available in six sizes, as set with 1 overstocking and 2 understockings each.

All compression measures used on bedridden patients must be discussed with the treating physician.

Saphenamed ucv is the medical compression stocking system for venous leg ulcer (Ulcus cruris venosum)



Pay attention to thorough skin care if you wear a bandage or a compression stocking. To prevent the skin from drying out, it is best to put rehydrating creams or ointments on your legs daily before you go to bed.

### Medical anti-embolism stockings and support stockings

Permanent prevention of thrombosis is necessary for all persons whose mobility is extremely limited or who are confined to bed. Because the lack of exercise slows down the flow-rate in the veins. The blood is transported back to the heart insufficiently and congestion occurs in the veins. This happens particularly when additional risks such as reduced heart output, varicose veins, overweight etc. exist. They can cause the formation of blood clots, or so-called thrombi. Such a clot can come off the vascular wall and enter the lung with the bloodstream. This leads to the risk of a life-threatening pulmonary embolism.

Therefore prevention (prophylaxis) is extremely important for all persons affected. The flow-rate of the blood is increased and the return transport of fluid-build-ups and metabolic products is improved by compression with suitable compression bandages.

In addition to the above-mentioned compression bandages whose use is not always very easy for a layperson, ready-made medical anti-embolism stockings and support stockings are also available. They guarantee medically correct distribution of pressure and improved blood circulation in the legs. They are easy to put on, permeable to air, and comfortable to wear.

Medical anti-embolism stockings are a prescription product. They may not be used for arterial vascular diseases.



Cambren C and VitoFit cotton

Product overview	Areas of application	Areas of application	Product overview
	<p><b>TenderWet 24 active</b> For active wound cleansing in chronic and infected wounds, for gentle detachment of necroses, germ reduction and conditioning of the wound ground.</p> <p><b>TenderWet active cavity</b> Used for draping in deep defects and pocket formation.</p>	<p><b>Hydrotul</b> For the treatment of acute or chronic wounds with stressed, sensitive skin; keeps the wound margin soft and supple.</p>	
	<p><b>Atrauman Ag</b> For the treatment of wounds in danger of infection or infected wounds as well as for prophylaxis against infections in chronic or acute wounds.</p>	<p><b>Hydrocoll</b> For treatment of medium to lightly exuding, non-infected wounds.</p>	
	<p><b>PermaFoam</b> For treatment of superficial as well as medium to heavily exuding wounds, particularly in sensitive or previously damaged wound site and infected wounds in combination with Atrauman Ag.</p>	<p><b>Hydrocoll sacral</b> Especially for treatment of decubitus in the sacral region.</p>	
	<p><b>PermaFoam comfort</b> Simple application in patients with non-sensitive skin thanks to self-adhesive fixation border.</p>	<p><b>Hydrocoll concave</b> For treatment of decubitus on heel and elbow.</p>	
	<p><b>PermaFoam sacral</b> For treatment of decubitus in the sacral region.</p>	<p><b>Hydrocoll thin</b> For treatment of lightly exuding and already epithelizing wounds.</p>	
	<p><b>PermaFoam cavity</b> For treatment of deep wounds with practical folding technique, also usable for infected wounds.</p>	<p><b>Hydrosorb comfort</b> Simple application thanks to self-adhesive fixation border. For treatment of wounds in the epithelization stage and burn wounds up to 2nd degree.</p>	
	<p><b>PermaFoam concave</b> For applications in the case of decubitus on heel and elbow.</p>	<p><b>Hydrosorb</b> For treatment of wounds in the epithelization stage and burn wounds up to 2nd degree.</p>	
	<p><b>Sorbalgon</b> For treatment of deep and fissured wounds which are medium to heavily exuding or bleeding.</p> <p><b>Sorbalgon T</b> Tamponing ribbons especially for narrow fistula passages and puncture channels.</p>	<p><b>Hydrosorb Gel</b> For the management of the most types of superficial and deep wounds and wounds of other geneses with slight exudation.</p>	
		<p><b>Saphenamed ucv</b> The medical compression stocking system for venous leg ulcer (Ulcus cruris venosum).</p>	

# How can you protect your skin?

Up to now we have informed you about how chronic problematic wounds occur, how they can be diagnosed and treated. But what can you do to optimally protect jeopardised or damaged skin yourself? Particularly elderly skin needs special attention.

In this chapter you will learn how important the use of suitable skin care products is and what characteristics they need to have.



Pressure sores, ulcerated legs and diabetic foot sores frequently occur in old age when concomitant diseases such as disturbed blood circulation or diabetes occur or the person affected is confined to bed. However, not only concomitant factors but also the various ageing processes of the skin play a decisive role in this case.

The skin becomes altogether thinner with increasing age, the nutrition of individual skin areas decreases. The sweat and sebaceous glands form less moisture and fat, which causes the skin to lose resistance. It becomes more sensitive to external influences. If subcutaneous fat tissue also decreases with old age, the skin becomes very prone to pressure points. Thus pressure sores occur faster in case of immobility or confinement to bed.

If the skin is additionally irritated by moisture, e.g. during perspiration, or if it comes into contact with faeces or urine possibly due to incontinence or if it is washed too frequently, the natural protective layer of the skin (acid protective layer) is destroyed. Then pathogenic germs can multiply easily and infections are the result. Further diseases and the intake of medication can reinforce this process.





If the skin is to remain healthy, it requires thorough care and protection. Cleansing and care products should be especially adapted to the deficient functions and needs of elderly skin, provide sufficient protection and promote regeneration of the skin.

### Cleansing the skin

Stressed or damaged skin requires mild and gentle cleansing so that it does not dry out or is excessively degreased. Menalind professional shower and washing lotion therefore cleanses very gently and can be used daily. Rehydrating substances such as panthenol and camomile counteract drying out of the skin. They soothe the skin already during washing or showering. If some parts of the skin are very soiled, these parts can be cleansed gently with Menalind professional cleansing foam. The foam gently dissolves the soiling so that it can easily be removed. At the same time the skin is conditioned by rehydrating substances.



### Skin protection

In the past household remedies like Vaseline (petroleum jelly) or bag balm were used to protect the skin. However these remedies impede perspiration and thus can even promote soreness. The Menalind skin protection cream and skin protection foam are a safe alternative. They form a protective film which protects the skin for many hours and effectively protects irritated skin against damaging substances.

The cream can be applied very sparingly. It forms a protective layer on the surface of the skin. The skin protection foam is a pleasantly light foam which forms a protective film in the skin for approx. 4 to 6 hours even when the skin is cleansed in between times. Both products contain panthenol and creatine to promote regeneration of the skin.

### Skin care

The Menalind body lotion contains rehydrating and regenerative substances which are able to bind moisture in the skin. This boosts the regeneration power of mature and irritated skin lastingly.

The Menalind skin care oil is suited for very dry skin on the lower leg. Whole-body care with the Menalind oil bath can contribute greatly to the wellbeing of persons affected with dry elderly skin.

Intensive skin care is important not only for extremely stressed parts of the skin around chronic wounds but also for rather dry skin all over the body in old age.



## Where can I obtain qualified advice?

The previous chapters provided detailed information on chronic wounds. If you have any further questions about this topic or your personal situation, please do not hesitate to contact our customer service for help.

The HARTMANN customer service is an advisory team of qualified employees who would like to answer all your questions about "chronic wounds" in an atmosphere of trust.



For many decades HARTMANN has been a reliable partner for users of its products for skin care and wound treatment as well as for incontinence management and for patient and personal hygiene.

Our standard service naturally includes the provision of help and advice to specialists as well as patients and relatives. This not only includes information about our products but also our assistance for you as an affected person in your personal situation.

Our employees are qualified specialists with professional experience of many years in nursing areas. They can immediately help you with competent advice and valuable tips and information if you have any questions on the topic of problematic wounds.

The customer service employees are committed to providing help and advice to those seeking advice. Your questions will be answered individually and in complete confidence. You can obtain advice and help on the telephone even if you do not wish to mention your name.

In addition to our telephone advice service, we are happy to provide you with written informative literature. You can also demand a limited amount of free product samples.

We are also happy to answer your questions by e-mail. Of course these inquiries will also be kept in confidence. Please send your e-mail to the following address:  
[customercarecenter@hartmann.info](mailto:customercarecenter@hartmann.info)



You can contact the HARTMANN customer service by telephone at the number 0180 23 04 275 on weekdays from 8.00 a.m. to 4.00 p.m. (telephone charges: euros 0.06/call).

# Dictionary of medical terms

## Arterial insufficiency

Arterial vascular weakness particularly due to arteriosclerosis.

## Arteriosclerosis

Literally translated: hardening of artery. Arteriosclerosis ("arterial sclerosis") results from a deposition of blood fats, thrombosis, connective tissue and calcium compounds in the blood vessels.

## Diabetic polyneuropathy

Nerve diseases which develop as a result of diabetes. They begin mostly in the feet. Due to sensitivity disturbance and numbness injuries are not noticed and wounds can occur. Their healing is delayed by metabolic disturbances; chronic wounds form such as a diabetic foot.

## Eczema

Non-infectious, intensely itchy inflammation of the skin. Also characterized by redness, swellings and small blisters and even discharging pustules may occur in eczemas.

## Epithelization

In addition to muscular, nervous and connective tissue, the epithelium is one of the most important types of tissue. The uppermost skin layer (epidermis) consists of such epithelial cells. They are clearly separated from the connective tissue and do not contain any blood vessels. The formation of new epithelial cells is referred to as epithelization.

## Granulation

When a wound or ulcer heals, new connective tissue forms which has many blood vessels running through it. This healing process is called granulation. The tissue has a granular appearance which is why it is called granulation tissue.

## Haematoma

Haemorrhaging. Accumulation of blood outside the bloodstream in the soft tissues.

Incontinence (urinary incontinence, faecal incontinence)  
Involuntary loss of urine or faeces. The term incontinence is derived from the Latin and means "being unable to retain something".

## Lesions

Minor injuries of an organ or part of the body.

## Necrosis

Dead tissue. Necroses are typical in chronic wounds of decubitus, leg ulcers (Ulcus cruris), gangrene and diabetic foot.

## Oedemas

Painless accumulation of protein-containing, aqueous fluid from the vascular system in the tissue.

### Recurrence

Recurrence of a disease after healing ("relapse"), e.g. recurrence of a healed wound.

### Sepsis

Massive reaction of the body to an infection colloquially referred to as blood poisoning. When microorganisms (mostly bacteria) from a site of infection (e.g. of a wound) enter the bloodstream and can spread throughout the entire body, the organism reacts e.g. with high fever, shivering, circulatory failure and other severe symptoms.

### Thrombosis

Partial or total occlusion of a blood vessel by blood clots (thrombi). They occur due to a slowing-down of the bloodstream and form primarily in the leg veins. The most dangerous complication of thrombosis is pulmonary embolism.

### Varicosis, varices

Varices are varicose veins of the legs; the corresponding disease is called varicosis. Varicose veins are dilated veins which occur due to a weakness of the venous walls or venous valves.

### Venous insufficiency

Disturbance of blood backflow in the legs caused by damage to the venous vessels.

## Where can you obtain further help?

You will find more answers to questions about the topic "chronic wounds" at the following institutions and organisations. They will also help you to find the right contact near you.

### Germany

Deutsche Gesellschaft für Wundheilung  
und Wundbehandlung e.V. (DGfW)  
c/o Frau B. Nink-Grebe  
Glaubrechtstraße 7  
D-35392 Gießen  
Germany  
www.dgfw.de

Initiative Chronische Wunden e.V. (ICW)  
Kuhtor 2  
D-37170 Uslar-Sohlingen  
Germany  
Phone: (+49) (0) 55 71 / 30 29 31 5  
Fax: (+49) (0) 55 71 / 30 29 31 9  
E-mail: ICWunden@t-online.de  
www.icwunden.de

### Austria

Österreichische Gesellschaft für Wundbehandlung  
Austrian Wound Association (AWA)  
Postfach 65  
A-1095 Wien  
Austria  
Phone: (+43) 1 879 03 79  
Fax: (+43) 1 879 04 90  
E-mail: office@a-w-a.at

### Switzerland

Swiss Association for Wound Care (SafW)  
Schweizerische Gesellschaft für Wundbehandlung  
Christine Stettler (Sekretariat)  
Schaufelweg 11  
CH-3098 Schliern  
Switzerland  
Phone: (+41) 31 / 972 55 30  
Fax: (+41) 31 / 972 55 31  
E-mail: sekretariat@safw.ch  
www.safw.ch

**If you wish to join a self-help group or if you are interested in patient training on the topics diabetes, diabetic foot, leg ulcers (Ulcus cruris) or decubitus, the following Internet addresses are also very helpful:**

<http://www.patienten-information.de/selbsthilfe.htm>  
[www.patientenleitlinien.de](http://www.patientenleitlinien.de)  
[www.diabeticus.com](http://www.diabeticus.com)  
[www.diabetes-friends.de](http://www.diabetes-friends.de)  
[www.dekubitus.de](http://www.dekubitus.de)

Further information is also available from your health insurance fund, the social services department, welfare centres and your treating physician.



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**Visit our Website:**  
[www.hartmann.info](http://www.hartmann.info)