

Diabetic foot ulcer

Therapy approach



Cutimed®

Advanced
wound care

A guide for the **successful therapy**

Every wound needs the best possible conditions for healing. Though no two wounds are the same, Cutimed® advanced wound care products help physicians and caregivers create the ideal conditions for wound healing.

The information to follow focuses on the treatment of diabetic foot ulcers. Diabetic foot ulcers are one of the most severe results of diabetes and 15% of all patients with diabetes will develop a diabetic ulcer*. Sadly, amputation is often necessary in later stages.

BSN medical offers a full range of dressings, fixation products, medical skin care and casting products to help you provide optimal treatment to your patients with diabetic ulcers and get them on their way to healing.

Diabetes is a widespread disease. Lifestyle choices, such as lack of exercise and an unbalanced diet, can lead to excessive blood pressure and excess weight, which can then lead to diabetes. Early recognition and taking a proactive approach – for example, proper skin and wound care – can help patients keep the late stage effects of diabetes in check.



of diabetic foot ulcers.

M E D I C A L
S K I N
C A R E

Necrotic wounds

Necrotic tissue inhibits wound healing. Hydrogels offer an alternative to surgically removing necrosis by creating a gentle method of debridement through moisture donation, as well as helping support autolysis.

Infected wounds

Critical colonization and wound infections can seriously hinder healing. Dressings that help reduce a wound's bacterial load, preferably without chemical agents or promoting bacterial resistance, are an effective option for wound management, without the risk of impairing the wound healing process.

Sloughy wounds

Gel products act gently to help remove slough, a mixture of fibrin, pus and cellular debris. Bacteria-binding dressings can further help reduce the bacterial load and encourage healing, without adding additional cellular debris to the wound.

Granulating wounds

Granulation is an important part of the wound healing process. Highly absorbent wound dressings that offer excellent exudate management and oxygen permeability, help optimize granulation as well as maintain an ideal wound environment for moist wound healing.

Epithelialising wounds

Key to treating epithelialising wounds is protecting the newly formed epithelium and fragile skin. Atraumatic dressings provide protection for the wound bed and peri-wound area, while medical skin care helps prevent the new skin from drying out to keep it more flexible and smooth.

W O U N D
B E D
P R E P A R A T I O N

E X U D A T E M A N A G E M E N T

Characteristics of diabetic foot ulcers.

What causes diabetic foot ulcers?

Both nerve damage and serious circulation problems can often occur as a result of poorly controlled diabetes mellitus. Without proper medical attention, these conditions can lead to foot lesions.

Neuropathy



A significant risk with nerve damage, or neuropathy, for diabetic patients is a reduced ability to feel pain, heat or cold. As a result pressure

points (e.g. from tight-fitting shoes) go unnoticed. In addition, nerve damage changes a patient's gait as the forefoot bears more of the body's weight. All of these situations can lead to pressure sores or lesions at risk for infection.

Angiopathy



As the diabetic patient's blood glucose levels increase, calcification can occur, often leading to arterial and capillary obstruction (macro-/

micro-angiopathy). As a result, body tissues receive inadequate oxygen and nutrients and could develop necroses. In addition to local wound management, arterial surgery may also be necessary.

The importance of controlling infection.

As a rule, frequent susceptibility to infections is an indication for "undiscovered" diabetes. Even if this disease has been diagnosed, particular attention should be paid to infections. The weakened immune system of diabetics is further exacerbated by poor blood circulation. As a result, the skin is also poorly circulated and can become porous. Bacteria and fungi can easily penetrate porous skin, causing infections that can quickly spread without thorough treatment.



An infection that initially affects the toes can spread to the forefoot and finally the other limbs.

The challenges of diabetic wound management.

Diabetic foot ulcers can be generalized into two wound types, pre-OP and post-OP. Both must be treated individually.

Pre-OP wounds

Wound healing complications, such as impaired healing or an increased number of infections, can impede the healing process for the diabetic patient. Modern therapies offer effective solutions, for example, dressings which attract, bind and remove bacteria and fungi from the wound.

Post-OP wounds

When gangrene or deep ulcers present a certain risk of spreading infection, surgical intervention will be necessary. The follow-up wound treatment will be based on the healing phases, paying particular attention to avoid any pressure on the wound.

Taking a holistic approach to patient treatment.

The therapy approach for diabetic foot ulcers goes far beyond wound healing. Treating the underlying disease is just as important. A balanced diet and patient compliance, for example, are important factors for recovery. For some patients, the psychological stress of diabetic foot ulcers cannot be underestimated and support from a psychologist can prove helpful.

▶ **Systemic control**

Health begins on the inside. The diabetic patient will need to follow an appropriate diet, which may need to be supplemented by oral antidiabetic drugs or systemic insulin injections. In all cases, regular checks are required.

▶ **Infection control**

In addition to reducing the bacterial load, for example, with dressings that attract, bind and remove bacteria from the wound, systemic antibiotic therapy may also be necessary to help control infection.

▶ **Pressure relief**



Pressure relief is critical to diabetic foot care and healing diabetic foot ulcers. There are several aids that can support the healing process. A total contact cast, as an example for off-weight casting, allows the wound to heal while at the same time, the patient can remain mobile. As an alternative, orthopaedic “walkers” relieve the foot from pressure during the day and can be removed for personal hygiene and during the night.

▶ **Nutrition**

The diabetic patient requires an adapted healthy diet plan. Working with a nutritionist, attending seminars and researching online education can all help the patient understand the importance of switching to the proper diet.

▶ **Regular assessment**

Regular assessment of the feet is critical to helping prevent diabetic foot ulcers. Seminars, often offered through the local hospital or clinic, help patients recognize pressure areas and injuries, particularly in desensitized areas due to neuropathy. Professional pedicures are also recommended on a regular basis.

▶ **Medical skin care**

Increased blood-sugar levels narrow the blood vessels and affect nerves. When diabetic polyneuropathy develops, the production of sweat and sebum decreases, resulting in dry and scaly skin. Appropriate medical skin care is recommended, including use of a moisture-balancing product containing urea.

▶ **Compliance**

By understanding the effects that diabetes can have on his or her life, a patient can also more effectively understand what needs to be done to actively reduce the potential for complications. Training sessions, consultations and therapeutic treatments are all recommended to help promote a patient's compliance.

Medical skin protection and care – an integral element of **ulcer therapy.**

Medical skin care: a preventative and therapeutic approach

The significant importance of medical skin care to professional wound healing is still widely underestimated. Medical skin care not only has a positive impact on all healing phases, but it also helps prevent further damage to the skin, contributing to a patient's general sense of well-being.

What is the basic function of the skin?

The skin is the body's largest organ and contains one third of the water stored in the body. The skin has many functions, including protecting the body from external factors, helping regulate temperature and water loss, as well as preventing substances from entering the body. In the treatment of exuding wounds, the threats are numerous, especially for incontinent patients. These rise significantly with elderly patients as skin is fragile and more susceptible to disease or damage.

Major factors impacting skin at risk:

External

- wound exudate
- urinary or fecal incontinence
- digestive fluids
- removal of adhesive products
- shearing forces

Internal

- age
- nutrition
- dehydration



► Skin areas to focus on:

Surrounding skin: Medical skin protection is of utmost importance in the healing of acute ulcers. Wound margins and peri-wound skin are at risk of maceration, which is caused by excess wound exudate and other body fluids. This damage to the surrounding skin can lead to an enlargement of the wound. Wound protection that supports the skin's barrier function is indicated to help prevent maceration (e.g. **Cutimed® PROTECT spray or foam applicator**).

Skin exposed to incontinence: The risk of skin maceration and diaper dermatitis is critical in the care of incontinent patients. Wide area treatment with a protective cream is recommended for these skin areas (e.g. **Cutimed® PROTECT cream**).

Skin impacted by lack of nourishment: As the dry diabetic skin provokes itching, the skin is threatened by scratching that most often causes a vicious circle, subsequently leading to an open wound and infection. Regular intensive skin care helps prevent irritation. Products containing urea (e.g. **Cutimed® ACUTE**) help meet very high moisture needs for especially irritated and dry skin.

New epidermis: The new, fragile skin of a healed ulcer requires special attention, as this skin can easily dry out if moisture decreases. Adequate medical skin care provides intense moisture to help keep the skin flexible and healthy and promote regeneration of the epidermal barrier (e.g. **Cutimed® ACUTE**).

Necrotic wounds:

How to achieve gentle yet **effective debridement.**

▶ Donate moisture to dry necroses:



Necroses should be removed from the wound bed as they impair wound healing and hinder the assessment of wound size and depth. Autolytic debridement can be effectively supported by hydrogels. **Cutimed® Gel** offers high moisture donation and helps to gently and effectively dissolve necroses. Cutimed® Gel may be applied with the applicator provided, with a spatula or directly from tube, being careful not to over apply as this can cause maceration.

Acting quickly may prevent amputations!

Spreading infection is always a consideration with diabetic foot ulcers. Therefore, surgeons may prefer to debride necroses surgically.

▶ Dissolve necrotic areas:



A secondary dressing (film or foam) ensures the hydrogel remains in place to help stimulate autolytic debridement to effectively dissolve necroses.

Film dressings

(such as **Leukomed® T**)

- prevent the hydrogel from drying out
- help maintain a moist wound environment
- provide a bacterial barrier.

Foam dressings with a silicone wound contact layer

(such as **Cutimed® Siltec B**, **Cutimed® Siltec Heel** or **Cutimed® Siltec Heel 3D**)

- prevent the hydrogel from drying out
- absorb wound exudate if present in other wound areas



Cutimed® Siltec Heel and ready-to-use Cutimed® Siltec Heel 3D (shown here) provide extra cushioning to the heel during the wound healing process.

Infected wounds: How to reduce the **bacterial load**.

▶ Bind and inactivate wound pathogens:



Cutimed® Sorbact® represents a new approach to advanced wound care. Through a purely physical mode of action, wound bacteria are irreversibly bound to the Cutimed® Sorbact® dressing. Once bound, they are rendered inactive and unable to replicate. These pathogens are then removed with each dressing change, reducing the overall bacterial load to support the natural wound healing process, without the risk of cytotoxicity or bacterial resistance.

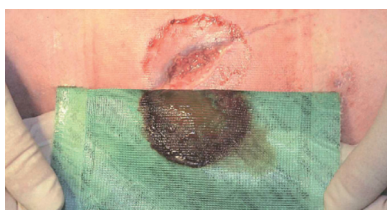


Apply swabs, round swabs, absorbent pads or gel dressings as primary dressings as needed, depending on wound size, depth and exudate level.

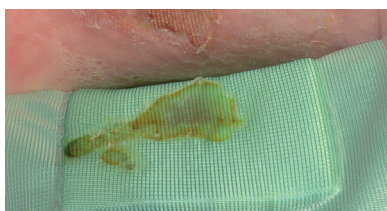


▶ Manage various amounts of exudate:

Depending on the levels of exudate, and the location and type of wound:



- Use **Cutimed® Sorbact® Hydroactive B**, a dressing that combines infection control with reliable fluid management and effective debridement. Its unique hydropolymer gel core can absorb high amounts of exudate while remaining permeable to water vapor to help prevent maceration.



- Choose **Cutimed® Siltec Sorbact®**, which not only provides infection prevention and control, but also rapid and reliable absorption for effective fluid management. The polyurethane foam helps maintain a moist wound environment for effective moist wound healing. Vertical absorption and a semipermeable top layer help prevent maceration. Plus, its gentle, readjustable silicone fixation border allows for atraumatic and painless dressing changes.

Or



- Apply **Cutimed® Sorbact®** ribbon gauze or swabs to the wound and cover with conformable film or foam dressing (depending on exudate level). A retention bandage ensures the fixation dressing will remain in place.

Keeping a dressing in place on an amputation wound might prove challenging due to the awkward anatomical shape. In most cases, a combination of products may lead to satisfying results. This combination could include:

- wide-area fixation
- retention bandages
- film or foam dressings

Sloughy wounds:

How to **cleanse the wound bed.**

▶ **Dissolve slough and necroses:**

Autolytic debridement, supported by hydrogels, is an effective yet gentle method to dissolve necrotic and sloughy tissue. **Cutimed® Gel** offers high moisture donation to help stimulate autolytic debridement. Cutimed® Gel may be applied a number of ways according to user preference, being careful not to over apply as this can cause maceration. The following methods of application can be used:

- directly from the tube
- via a sterile spatula (due to it's viscosity even upside down, which is a major advantage in daily practice)
- with the sterile applicator (for deeper parts of wounds)

For best results make sure to cover Cutimed® Gel with a sterile film dressing (e.g. **Leukomed® T**). Following amputations, retention bandages (e.g. **Easifix® K**, **Elastomull® haft**) might be required to increase fixation time.



▶ **Prevent or manage infection while also dissolving slough:**



Cutimed® Sorbact® gel combines a bacteria-binding dressing with hydrogel. As a ready-to-use dressing, it takes advantage of Sorbact® technology to bind and inactivate wound pathogens, while the hydrogel helps stimulate autolytic debridement to clean the leg ulcer of slough and fibrin layers.

- Ensure overlapping edges are folded back in the direction of the wound to avoid maceration of surrounding skin and wound margins
- Apply a secondary dressing to manage the wound exudate and excess moisture (e.g. **Leukomed® T**, **Cutimed® Siltec B**, **Cutimed® Siltec Heel** or **Cutimed® Siltec Heel 3D**)

Important:

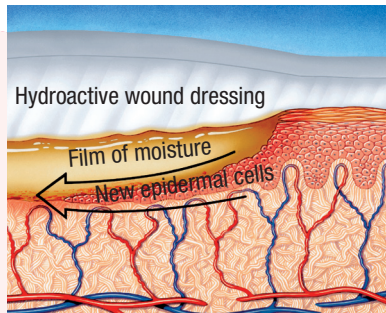
- The process of healing a wound must also take into consideration the underlying disease and relevant risk factors. For diabetic patients, it is important to provide adequate pressure relief either by off-weight casting or a walking device.
- Immobile patients frequently develop pressure ulcers on the heel. This is of particular concern for diabetic patients. Heel dressings that combine cushioning with exudate management (e.g. **Cutimed® Siltec Heel** or **Cutimed® Siltec Heel 3D**) might be appropriate.
- The skin surrounding a diabetic foot ulcer may be fragile, sensitive or dry. **Cutimed® ACUTE** with 5 or 10 % urea helps very dry skin to re-balance its moisture content and to stabilize its natural barrier function.



Granulating wounds:

How to promote and protect the formation of new tissue.

Keyword: Granulation



A moist wound environment encourages granulation and epithelialisation from the margin of the wound inwards.

Today, the principle of moist wound healing is well-accepted as the therapy concept of choice for chronic wounds. It has been confirmed in daily practice that moisture has various beneficial effects in the wound bed:

- nutrients, growth factors, and enzymes can easily spread in a moist wound
- moisture helps facilitate the proliferation of new cells
- epithelialisation can occur more quickly in a moist wound environment

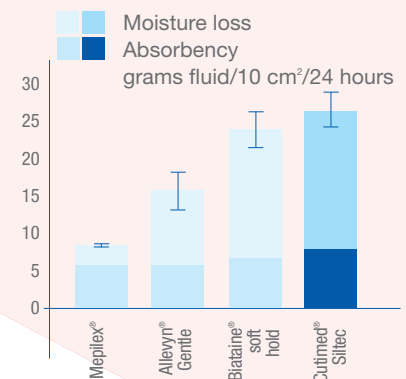
As a result, modern wound dressings should help support a balanced level of moisture in the wound bed.

Why fluid handling is so important:

For state-of-the-art foam dressings to maintain a moist wound environment, they must be designed to handle different amounts of exudate. Caregivers can confidently rely on the high absorption capacity and superior vapor permeability of **Cutimed® Siltec** products for effective fluid handling and management.

The effect:

- Superior fluid handling increases wear time for savings in both cost and nursing time
- Exudate is absorbed quickly and vertically away from the wound bed to prevent the exudate from spreading horizontally through the dressing
- Vertical absorption helps keep excess moisture away from the wound to help prevent maceration
- Super-absorbers embedded in the foam core, effectively retain exudate



Minimizes the risk of maceration: In-vitro tests confirm the outstanding fluid handling of Cutimed® Siltec (SMTL test 2008, data on file).

Important:

- The process of healing a wound must also take into consideration the underlying disease and relevant risk factors. For diabetic patients, it is important to provide adequate pressure relief either by off-weight casting or a walking device.
- Immobile patients frequently develop pressure ulcers on the heel. This is of particular concern for diabetic patients. Heel dressings that combine cushioning with exudate management (e.g. **Cutimed® Siltec Heel** or **Cutimed® Siltec Heel 3D**) might be appropriate.
- The skin surrounding a diabetic foot ulcer may be fragile, sensitive or dry. **Cutimed® ACUTE** with 5 or 10 % urea helps very dry skin to re-balance its moisture content and to stabilize its natural barrier function.



▶ Maintain a moist wound environment:



Maintaining a moist wound environment is a primary goal during the granulation phase of wound healing. **Cutimed® Siltec** dressings are designed to support moist wound healing through excellent fluid handling. In addition, the atraumatic silicone wound contact layer ensures a gentle adherence and helps protect the newly formed tissue during dressing changes.

Choose the appropriate dressing for each level of exudate:

- **Cutimed® Siltec** – for moderate to high levels of exudate
- **Cutimed® Siltec B** – border dressing for moderate to high exudate levels
- **Cutimed® Siltec L** – for low to moderate exudate levels
- **Cutimed® Siltec Heel/Cutimed® Siltec Heel 3D**: foam dressing for moderate to high exudate levels, designed for various heel shapes

▶ Apply appropriate secondary fixation:

Amputation wounds require special bandaging techniques and materials, which can be combined as necessary.

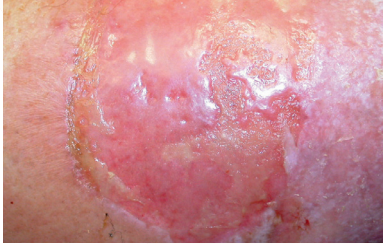


Reliable dressing techniques may include a combination of:

- wide-area fixation
- retention bandages
- film dressings

Epithelialising wounds: How to protect **new tissue**.

► Protect new, fragile skin:



When the wound has filled with granulation tissue and epithelial cells begin to grow from the wound margins, the amount of exudate is likely to decrease. A thinner foam dressing may now be appropriate, such as **Cutimed® Siltec L**, which is both more conformable and comfortable to wear. Outstanding vapor transmission rates and embedded super-absorber particles ensure reliable fluid retention to help reduce the risk of maceration.

► Ensure atraumatic dressing changes:



All **Cutimed® Siltec** dressings are designed with a silicone wound contact layer. This provides gentle adherence to the dry peri-wound skin and no adherence to the moist wound bed at all. Because less exudate is produced as new, fragile epithelial cells cover the former wound area, this silicone wound contact layer is critical to protecting these new cells. The healing process remains undisturbed and patients experience pain-free dressing changes.



The benefits of Cutimed® Siltec's silicone layer include:

- gentle adherence to fragile epithelium
- undisturbed healing progress
- atraumatic, pain-free dressing changes

Once a wound is completely closed, sterile film dressings (e.g. **Leukomed® T**) can be used to protect the fragile, dry skin.

Important:

- The process of healing a wound must also take into consideration the underlying disease and relevant risk factors. For diabetic patients, it is important to provide adequate pressure relief either by off-weight casting or a walking device.
- Immobile patients frequently develop pressure ulcers on the heel. This is of particular concern for diabetic patients. Heel dressings that combine cushioning with exudate management (e.g. **Cutimed® Siltec Heel** or **Cutimed® Siltec Heel 3D**) might be appropriate.
- The skin surrounding a diabetic foot ulcer may be fragile, sensitive or dry. **Cutimed® ACUTE** with 5 or 10 % urea helps very dry skin to re-balance its moisture content and to stabilize its natural barrier function.



Preventing recurrence.

Protection and assessment

Diabetic foot ulcers do not necessarily reoccur. With full patient involvement, new ulcers can be avoided or recognised and treated early on.

▶ Foot care

Patients need to learn how to examine their feet daily. They must understand that the friction and skin irritation from just a small stone in the shoe can lead to a diabetic foot ulcer. Regular checks and professional pedicures are vital. Comfortable footwear helps avoid pressure points, which could go unnoticed if neuropathy is present. If sensitivity disorders already exist, shoes must be checked for rough areas frequently.

▶ Diabetic socks

Diabetic socks are designed especially for the needs of diabetic feet, offering both comfort and protection (e.g. **SensiFoot**[®]). Not only does the extra-padding in the foot, heel and toe reduce friction, but acrylic multi-fibre yarns wick away moisture to help keep feet dry.

▶ Fitness for feet

Daily exercises help relax the feet and promote circulation. Special training sessions help demonstrate ideal exercises for diabetic patients.

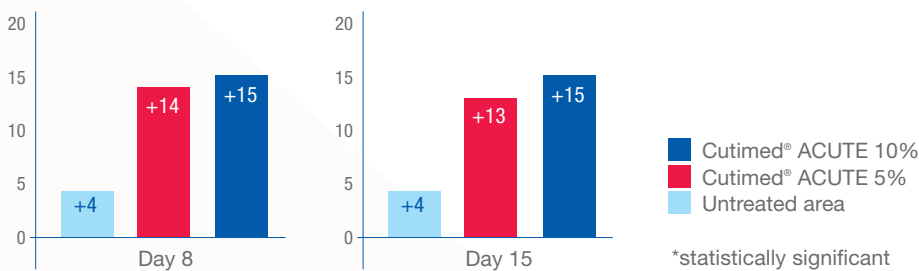
▶ Provide medical skin care to moisturize and replenish skin

Very dry and itchy skin can be treated with a lotion or foam containing urea, such as **Cutimed[®] ACUTE 5%** or **10%**. Urea-based products can be used externally to bind water, re-balance hydration and help restore elasticity and smoothness to skin. Cutimed[®] ACUTE is well-tolerated by fabric.



Excellent skin hydration by Cutimed[®] ACUTE

Change of corneometer units from day 1



All you need

for the successful therapy of **diabetic foot ulcers.**

Primary dressing

Necrotic wounds



Cutimed® Gel

Donates moisture to dry necrotic or sloughy wounds.

Depending on level of exudate:

Infected wounds

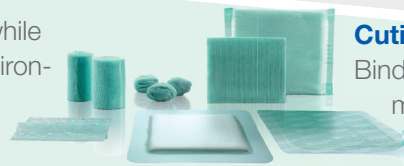


Cutimed® Sorbact® gel

Reduces the bacterial load while providing a moist wound environment, cleanses wound from slough and fibrin layers.

Cutimed® Sorbact®

Binds and thereby inactivates microbes in colonized and infected wounds.



Sloughy wounds

Cutimed® Siltec Sorbact®

Super-absorbent polyurethane foam dressing combined with Sorbact® technology for moderately to highly exuding wounds; skin-friendly silicone adhesive border.

Cutimed® Sorbact® Hydroactive B

Absorbent hydrogel core combined with Sorbact® technology for low to moderately exuding wounds; reliable skin-friendly adhesive border.

Granulating wounds



Depending on level of exudate and location of the wound:

Cutimed® Siltec/Cutimed® Siltec B/ Cutimed® Siltec Heel/ Cutimed® Siltec Heel 3D

Super-absorbent polyurethane foam dressings with silicone wound contact layer. Maintain a moist wound environment in wounds with moderate to high exudate levels and allow atraumatic dressing changes.



Cutisorb® LA

A low adherent wound contact layer with excellent absorption.

Epithelialising wounds

Cutimed® Siltec L

Maintains a moist environment in wounds with low to moderate exudate levels and allows atraumatic dressing changes.



Recurrence prevention



SensiFoot®

The diabetic sock designed to help reduce friction and pressure



Cutimed® ACUTE

Provide regeneration and care to stressed and dry skin, and prevent recurrence.

Secondary dressing/fixation



Cutimed® Siltec B

Maintains a moist environment in wounds with moderate to high exudate levels. Can also be used as a secondary fixation and allows atraumatic dressing changes.

or



Leukomed® T

or

Fixomull® transparent

The waterproof, fully adhesive transparent dressing for easy wound inspection.

or



Gazofix®

Self-adhering, elastic fixation bandage. Extra thin, can also be worn with shoes.

or



Elastofix®

Highly elastic mesh band. Can be individually cut to size.

or



Easifix® K

Soft, cohesive retention bandage. Light-weight and comfortable for swift application.

Skin care



Cutimed® PROTECT

Re-establishes the skin's barrier function and protects wound edges.



Cutimed® ACUTE

With 5% or 10% urea for very high moisture needs.

Pressure relief

For off-weight casting (e.g. total-contact-cast), a special casting technique that combines strength and rigidity with enhanced patient comfort, the following products are recommended:



Delta®-Lite Plus

Fiberglass cast tape combining a fiberglass substrate and an advanced water activated polyurethane resin system, which provides tack-free properties.

Delta Terry-Net® C

Cotton terry cloth stockinette

Artiflex®

Soft, synthetic, cast padding

Delta Terry-Net®

Adhesive felt padding

Delta Terry-Net®

Adhesive fleece liner

Discover the world of BSN medical.

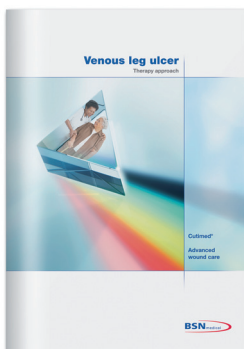
For more information and therapy approaches for other indications, please visit www.cutimed.com or contact us.



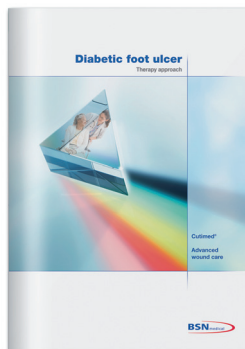
Assortment folder



Cutimed® Sorbact® folder



Therapy approach:
Venous leg ulcer



Therapy approach:
Diabetic foot ulcer



Therapy approach:
Pressure ulcer