

BAUER BANDAGE

Interactive bandage
based on the activated micro-filament carbon and diffusion pump

A sterile bandage dressing with purified activated carbon in the form of micro-filaments, featuring an increased adsorbability due to the induced diffusion. Its purpose is to treat a wide spectrum of purely curable wounds and defects during all the phases of healing, to stop surface bleeding, and to detoxicate tissues. For prolonged periods of activity time this bandage will help make and maintain an optimum microclimate in the wound where a harmonious healing process can take place.

In its pure form of micro-filaments the activated carbon has three main applications in the field of modern therapy: treatment of the acute bleeding wounds where a dry carbon layer application predominates, treatment of the hardly curable wounds and defects where a "watery curing" rule is accepted as one of the alternative techniques summarized under the generic term of "watery curing", and the first aid in the case of intoxicated wounds or as a part of the comprehensive treatment upon stings, bites or other wounds caused by venomous organisms or after the bodily contacts with the toxins of many different origins.

Useful information on how to apply properly the interactive sorption bandages and other medical items with an active double-layer applied, making use of diffusive pump effect which allows to improve the curing potentials in case of a wide variety of disorders.

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CARBONITE = ACTIVATED CARBON

It its primitive forms carbonite was used to decontaminate wounds since the time immemorial. "Animal charcoal" is now widely used therapeutically as an intestine detoxicating agent. In its various forms the active charcoal forms now an indispensable part of the gas mask filters that protect from action of many various toxins dispersed in air. In addition to their industrial applications the purposely developed forms of the activated carbon are also ever increasingly used in the contemporary medicine within the limits of many different filtering processes. When developed on its basis the sorbents play, for example, a key role where the chemically intoxicated topsoil is to be decontaminated.

Sorptive bandage dressings of the surface and deeper wounds and defects constitute a relatively new activated carbon therapeutic application. They are able to prepare the conditions in which a harmonious curing can take place thanks to a well-stabilized micro climate. With growing experience in their usage these efforts are ever more successful in case of such infections where satisfactory results could earlier be achieved only subject to an extraordinary care, considerably material costs, and faultless patient's cooperation. The activated carbon new application form in the field of wound curing seem to close the circle started being drawn by a primeval hunter who, striving to stop his bleeding and advancing inflammation, poured into his wounds the powdered cinders from the campfire that had just cooled down...

INTRODUCTION

to applying the sorptive materials from the BAUER BANDAGE FAMILY that make use of an active double-layer to provide a diffusion gradient.

Based on activated carbon micro-filaments and potentiated by a diffusion pump effect this medical aid will ensure the optimum conditions in which the otherwise hardly curable wounds can be cured in a harmonized way, leading to an earlier haemostasis through a highly accelerated haemocoagulation and suppressing the exogenous toxin infiltration into the organism, their propagation and action there.

Its main indication fields are the following:

- A Haemostypsis
- B Curing
- C Detoxication

As a natural part thereof the purified activated carbon is environment-friendly, featuring an easy use, can be stored easily, being price-affordable and safe.

The activated carbon materials used to treat wounds have a long history behind. Dramatic growth in the knowledge levels, mainly during the past two decades, made it possible to construct new generations of the bandaging materials that utilize the unique features of the activated carbon special forms, widely summarized as potentiated micro-filament bioactive carbon.

Its micro-filament form stands out from among these forms for its chemical purity and in comparison with other forms widely used so far, having a better absorbability and larger active specific area of its surface that can be used in practice. Just this form of the bioactive carbon is one of the two main raw-materials of the active double-layer, used as active raw-material ingredients in production of the medical aids from the BAUER BANDAGE family, designed to be widely used in both the human medicine and veterinary practice.

For external applications

Currently, the widely available forms of medical aids that use an active double layer as their basis are applied to cure the wounds and skin coating defects. The physically and chemically activated carbon has no direct involvement in the metabolic processes in the living organism, not bringing therein any foreign substances or inducing the evolvement of the substances that have not yet been present in the body. Its bioactivity rests in its capacity to bind physically and chemically a wide spectrum of the substances and particles present in the wound, but undesirable there. Due to its extremely large area and physical and chemical characteristics the bioactive carbon is, in respect of the curing processes, able to influence the responses of the immediately adjoining tissues. Owing to the widely known characteristics of the activated carbon as a detoxicating agent it is out of the question that it could have an irritating or toxic effect on a live tissue.

Used to cure completely the wounds the BAUER BANDAGE medical products differ tremendously from the conventional products applied in the case of similar indications. The main differences are the following:

Bioactive carbon is applied for a certain span of time, depending on the gradual saturation of the carbon layer total sorptive capacity. Length of this span of time depends on a particular wound curing phase, toxin contamination level, level of infection proliferation (colonization with microorganisms), quantity and nature of the wound-defect-produced exudate.

It is directly in contact with tissues. Because of the absolute purity and chemical nature of an efficient detoxicating agent and quite good cohesion of the carbon micro-filaments it is not necessary and desirable (from the functional point of view) to extract this form of the bioactive carbon from the surroundings it has to affect, using any kind of barrier, such as a semi-permeable membrane, as it is obvious with most other active

charcoal based preparations that show either a lower purity of the carbon substrate or non-cohesive nature of its form.

Effect on tissues and wound/defect surroundings/on the surface of affection is a comprehensive set of chemical and physical actions where the different functional mechanisms, given by the microstructure and nature of this material, will play a role to a varying extent, depending on the nature of the wound.

One has to perceive clearly the main differences in the treatment procedures applicable to three basis indication areas of the BAUER BANDAGE medical products:

Treatment of acute bleeding wounds where a foreground effect rests in a much speedier bleeding stoppage – haemostasis – where the medical aids from the BAUER BANDAGE are dry applied, often as short-time compresses only. In its nature, it is rather a tool than a bandage, as the application times used to achieve the haemostasis are measured usually in tens of seconds, but never more than few minutes.

Treatment of the hardly curable wounds where mainly a sorptive function takes place provided that the “watery curing” tenets are observed.

Treatment of an injury in the presence of an exogenous toxin where the temperature of the applied dressing will have to be born in mind, depending on the toxin thermal stability.

For internal applications

Practical use of the materials based on the potentiated bioactive carbon in the sterile surgical operation field is at its early stage. Preparations for the clinical studies of a wide spectrum of its indicative surgical usage potentials are underway. Mainly the capacities in the field of local haemoconcentration and accelerated startup of the haemocoagulative cascade will dominate here. This seems to predestine the product to become a sparing tool able to stop speedily the mixed bleeding in the case of the heal-ups butt separation or the bleeding from the cut surfaces on the parenchymatose organs, etc. Practical application of the convenient forms of the medical products from the BAUER BANDAGE family is rather a question of a routine technical solution and necessity to make sensible clinic tests than a matter of a factual research.

This is why the product can reasonably be expected to extend the range offered by BAUER BANDAGE as soon as the time necessary for a proper clinical testing is over.

STRUCTURE AND CHARACTERISTICS

Medical items from the BAUER BANDAGE family consist of an active double-layer shaped and extended with other materials as specified for the material of the given type. The main function is borne by the micro-filament carbon layer which has the form of a fabric with the mean fiber diameter measured in tens of μm with its affect boosted by the presence of the diffusive active layer of a non-woven fabric of a particular design with several types of fibers involved. In addition to these two active layers there are often some auxiliary layers of the materials that allow fixation, such as self-sticking layers for the plasters, the absorptive materials that provide moisture for prolonged periods of time, the layer used to prevent water evaporation from the bandage, heat-insulating layer, etc.

Sizes and shapes

Medical products with the active double layers are made in the scale of sizes that reflect optimally the sizes of wounds/defects. Sometimes they also feature a special shaping to match the usage purposes. All the layers are highly porous and easily permeable. This provides them with a good liquid retention capacity and – in event of the carbon layer – also with an extraordinary absorbability and adsorbability.

Unlike most other medical products that make use of the carbon sorptive capacities the BAUER BANDAGE preparations can be shaped in any way by trimming. This tends to be impossible with other materials as they have a structure of the closed cushions that contain the loose or not quite pure forms of active charcoal, and cannot therefore be applied directly to the wound.

Sorptive layer

Is directly in contact with the body surface, made of the micro-filament carbon having a macroscopic form of a woven fabric with the filaments in one bundle numbering from 900 to 1500. A fabric from a chemically pure hydro viscose of a vegetal origin is used as an initial raw material in making the purified carbon micro-filament. Sorptive function of the layer is given by both the fibrous macrostructure and widely known characteristics of the activated carbon. Here, the sorptive capacity is several times better in comparison with the activated carbon normal forms. These normal forms tend to have a non-fibrous structure, being arranged to the parallel plates with empty spaces between them.

Diffusion supporting layer

In order to potentiate the sorptive function there is the second, diffusion supporting layer of a non-woven fabric. Its physical characteristics are balanced carefully by means of a special mixture of the filaments of two different types. While the polypropylene filaments have the capacity to channel water through the lengthwise capillary fissures, hydro viscose is retaining water thanks to its high absorbability and its ability to bind water. For the time indispensable the non-woven fabric layer is providing reliably a concentration gradient between the wound surroundings (where there is a maximum of the dissolved and emulsified substances) and the surroundings above the sorptive carbon layer where the concentration of the dissolved substances is close to zero. The "diffusion pump" effect results in a more perfect utilization of the micro-filament carbon total sorptive capacity throughout the entire fabric thickness, being patent-protected as one of the main functional principles of this material.

Moisture retaining layer

made of a non-woven fabric, normal in its structure, which helps keep the surroundings watery. In the case of the appropriately sized types the thickness of the non-woven fabric is graded from the thinnest to a very thick. A respective time interval during which this layer is able to ensure the moisture retention under the really normal conditions (temperature, air humidity, airflow rate, water re-absorption to the circulatory system through the wound surface) without the necessity to add any additional solution beyond the bandage checking/redressing intervals is assigned to every particular thickness.

Separating screen

Application of the Teflon-based separating layer, greasy tulle, etc. was fully abandoned gradually during the course of the Bauer Bandage usage. Carbon layer sticking to the wound bottom or directly the carbon filament curing into a newly formed granulations or epithelium is a complication that can only occur as a result of breaching grossly the main rules of treatment with an interactive bandage of this type. An intermediate separating layer is only a rescue crutch used to disguise a wrong treatment procedure and thwarting in fact the unique main feature of the pure carbon which – just by the immediate contact with the wound surface – provides the full capacity of its sorptive abilities.

Any intermediate layer between the wound and carbon layer is a mechanical obstacle and added resistance that inhibits the infiltration of the undesirable substances into the bandage surroundings where their absorption and actual neutralization can only occur.

Sticking plaster base

The preparations extended to include a self-sticking plaster layer have been sampled out for minor wound easier fixation and protection. Plaster forms are made in three lines, differing in the supporting layer properties – with a high tensile strength, making it possible where indicated to close the wound edges to each other, with increased air permeability, and finally with a protective layer featuring an increased resistance to external water actions.

FUNCTION-RELATED PHYSICAL PRINCIPLES

Absorption

A so-called primary absorption takes place at the opening phase of the treatment. During the course of this phase the exudate is absorbed by the carbon micro-filament structure and the tissue fluid is simultaneously drawn off the intersticia just around the wound. This action is dynamic in course, taking seconds to minutes, depending on the exudate viscosity and structure.

Capillary forces

One of the important functional characteristics of the micro-filament carbon is its capillary absorption given by the dimensions of the inter-filament capillary spaces and exudate surface tension. According to the Kelvin Law the relationship between the (positive or negative) capillary forces inside the structure of the micro-filament carbon is given by the exudate surface tension, exudate drop capillary rising angle, and mean dimension of the carbon inter-filament spaces as follows:

$$\Delta P = (4Y \cos\Theta) / d \text{ [N/m}^2\text{]}$$

where:

ΔP	=	hydrostatic pressure (N/m ²)
Y	=	exudate surface tension (N/m)
Θ	=	exudate drop capillary rising angle on the carbon micro-filament surface
d	=	mean dimension of the inter-filament space

As the bioactive carbon micro-filament fabric can be compressed, one can, to an extent, "control" the size of the inter-filament spaces. By action of a slight compression only during the bandage application to the wound one can achieve a short-time densification of the fibrous structure and the corresponding reduction on the mean size of the capillary spaces.

We have selected three states of the fabric for the following calculation:

Inter-filament space	uncompressed fabric	med. compressed. fabric	compressed fabric
Exudate surface tension (Y)	0.07 N/m	0.7 N/m	0.07 N/m
Exudate capillary rise angle (Θ)	0°	0°	0°
Cosine Θ	1	1	1
Inter-filament space size (d)	0.000015	0.000010	0.000007
Vacuum inside carbon fabric:			
(N/m ²) = Pa	18,666	28,000	40,000
(kPa)	18,6	28,0	40

Potential of the capillary forces that can be applied by compressing reasonably the carbon fabric structure is obvious in comparison with the pressure conditions that prevail in the bodily fluid. In the affected tissues these forces are mainly related to the systolic pressure of about 156 kPa and to the filling capillary pressure of about 4 kPa. It is clear from the above calculation that a slightly compressed fabric will bring about the conditions in which the vacuum in the fabric exceeds substantially the pressure in the blood circulatory system. This vacuum can in fact not only draw the exudate off the wound surface, but also the tissue fluid from the inter-cellular spaces (interstitia) of the immediately related tissue layers at the phase of primary absorption (i.e. just as soon as the bandage is placed onto the wound within the span of several minutes). This action is of

primary significance for draining efficiently any exogenous toxins that would otherwise infiltrate into the organisms through blood vessels.

Elastic absorbability

In addition to the capillary forces the absorbability which owes to the fabric elasticity for its existence plays a role during the initial saturation of a dry-applied ZP from the BAUER BANDAGE. As soon as the initial compression gets released, the fabric tends to restore its initial shape (like e.g. a plastic foam sponge). At this phase, another part of the "suction effect" will take place, matching the force with which the fabric was first compressed, after the component used up to deform the fabric permanently is subtracted.

Adsorption

is a basic long-term functional mechanism which plays a role during the treatment with the aid of medical preparations based on the activated carbon. In general, the substances on the surface can be said to get enriched from the surrounding phase. Adsorption from the gaseous phase (wound deodorization) to the liquid phase (wound detoxication and decontamination) can take place on the active carbon. The molecules dispersed in the surrounding phases infiltrate into the activated carbon solid phase within this adsorption. In the case of adsorption of our products lets draw a difference between the physical adsorption (fysiosorption) and chemical adsorption (chemosorption).

Physical adsorption is based on action of the Van der Waals forces. The adsorbed substances will remain unchanged at the output of this process. The physical absorption is a reversible action, i.e. the substances, once absorbed, can get released in their original structure under certain conditions.

Chemosorption give rise to chemical bonds between the substances adsorbed and the carbon filament surface with their structure changed. Chemosorption is a more or less irreversible action. Chemosorption will result in extinction of the dissolved substance molecules with an impact on the diffusion application throughout the exudate. Less number of dissolved substances in a watery dressing will result in reduced exudate and tissue fluid osmolality.

In the case of an edematous field this action will result in water re-infiltration into the blood circulatory system through a semi-permeable endothelium membrane, followed by step-by-step edema disappearance with positive impacts on the tissue perfusion.

Given this basic mechanism applied, mainly the presence of the diffusion-active layer of the non-woven fabric will stand out unlike with other materials based on the active carbon. With the aid of this layer it is feasible to make use of a portion of the carbon specific active area (expresses in m^2 per 1 g of weight, published as ranging from 500 to 1,500 m^2/gram) only in the event when a material with its active double-layer several times higher than in the case of other forms being widely used in medicine.

In contrast to the normal forms with plated structure moreover the raw material used exhibits the carbon filaments featuring the mean filament thickness in the order of tens of μm with a permeable structure in which, unlike with plated structure, the substances dissolved or emulsified in the exudate can penetrate down to the deep layers, saturating them step by step.

In this respect, the micro-filament bioactive carbon, potentiated moreover with a layer of the diffusion-active non-woven fabric, is the material with quite extraordinary properties.

Diffusion

Is applied within the active double-layer as “diffusion pump” active on a long-term basis. The bioactive carbon sorptive layer can be perceived as a permeable membrane with a certain resistance, inhibiting otherwise quite unobstructed molecular infiltration of the substances dissolved or emulsified in the exudate. Beneath this “membrane” towards the wound/defect bottom, there is – emerged in the aquatic surroundings – a certain concentration of the dissolved or emulsified substances, but above the “membrane” there is a layer of the non-woven fabric with a minimum concentration of these substances. Making use of this diffusive gradient, the dissociated molecules will migrate into the space above the “membrane”. Here, this diffusion must overcome the resistance posed by the carbon “membrane”. But on their way, these substances will get in the immediate contact with the bioactive carbon surface, being there adsorbed physically or chemically, depending on their nature. Diffusive gradient is therefore retained further on, remaining active until the sorptive capacity of the bioactive carbon layer gets used up or until the inter-filament spaces get clogged with detritus, blood elements, or microorganisms.

PHYSICAL FACTORS

Core of the ACTIVE DOUBLE-LAYER – wound/defect surface interaction

Actual relative actions of the functional mechanisms have to be distinguished, depending on the nature of the wound/defect and on the phases of its healing.

WATER “MANAGEMENT”

In case of a strongly exuding wound the BAUER BANDAGE should be dry-applied. Here the advantage is that the exudate is quickly drawn off within the primary absorption. Even the bacteria and toxic substances, and/or molecular complexes with a relatively high molecular weight are brought into the micro-filament carbon structure alongside. These substances are absorbed in between the carbon fabric filaments, being then adsorbed as stuck onto the surface of these filaments by action of both the chemisorption and physisorption.

The diffusion pump effect will start playing a role once the diffusion-active layer of the special non-woven fabric gets fully saturated with the liquid phase. The substances dissolved in the wound liquid phase and above the wound surface tend to penetrate into the layer of the active non-woven fabric through the carbon layer. As soon as they achieve the zone where the carbon is still unsaturated they are absorbed there.

In the case of mid-exuding wounds the water column must be increased by adding some water from the side of the active non-woven fabric. The purpose is to draw off all the exudate and also to prepare the appropriate conditions for the diffusion pump action by connecting the “endogenous” water with “exogenous”.

Should it be a dry wound, water has to be added to both active layers of the bandage and the diffusion pump started “from outside”.

With a thick, viscous exudate a larger portion of the exogenous water should be added still BB is applied directly to the wound. The purpose is to thin this exudate and facilitate its subsequently easy absorption.

Efficiency affecting factors

pertaining to the efficiency of the medical products from the BAUER BANDAGE family upon wound treatment.

Main physical factors that can affect the efficiency of the BAUER BANDAGE products in the field of wound treatment are those that influence the water column action within the structure of the bandage active layers, the exudate amount and nature, level of the adsorptive layer saturation, and the extent to which the bioactive carbon layer is in contact with the wound surface.

One has to keep in mind the fact that the capillarity will stop exercising its action as soon as the bioactive carbon layer gets saturated. When the bioactive layer is contaminated with a hydrophobic substance, such as a Vaseline or grease, the exudate will not moisturize the bioactive layer evenly.

Contact with wound

The BAUER BANDAGE based medical products can only exert right action where they are directly in contact with wound. A wrong application with the bioactive layer not in contact with the wound surface or not dressing the wound optimally or where right contact thwarting dried up scabs, necroses, putrid coats, etc. are present must be remedied with a suitable surgical action.

Active carbon saturation level

One has to watch that the color of the non-woven fabric diffusive-active layer surface does not transpire. This phenomenon will come up when the carbon layer sorptive capacity is nearly used up and the layer has to be replaced.

PATHOLOGICAL SYMPTOMS

and bioactive double-layer active mechanisms involved in controlling these symptoms

Deodorization

Perfect odor elimination will follow shortly after a medical product from the Bauer Bandage family is applied. Both the chemisorption and physisorption will also get involved, mainly at the initial phase of the chronic defect healing where these defects are mainly treated with BB by means of the watery curing method. Once the active sorptive bandage is placed, the gas molecules and the "aromatic" substances containing droplets that irritate olfaction will get absorbed. Here, mainly the adsorption will get involved in both its forms: chemisorption will bind the absorbed molecules to the free bonds due to the diameter of the carbon micro-filament of the superficially located carbon atoms and physisorption catching up some of the molecules on the filament surface by action of the electrostatic forces.

Bacteriostasis

The bacteriostatic effect will take place as a result of a specific microclimate created in the wound (i.e. both on its surface though also with impact on the intercellular tissue spaces at its surface) and maintained there for a prolonged period of time (throughout the wound curing process) where an active sorptive dressing has been applied. This microclimate features the sorption effect application alongside the long effect of the diffusion pump. These mechanisms are actually responsible for extraction of all the freely dissolved and emulsified substances in the wound climate, including those that could be used by the microorganism as their nutritive substrate. Bacteria cannot therefore reproduce themselves to any major extent as they lack necessary nutrients on a permanent basis.

Analgesia

An analgesic effect will come up as a result of the extracted inflammation mediators and other substances that irritate the free nerve ends inside the wound. Paradoxically, increased pains tend to be recorded in some cases, mainly at the initial phase of the wound healing process. This appears as a result of the naked nerve ends, once the detritus is removed. At this phase the pain receptors are directly exposed to the irritants that have not yet vanished from the wound and the pain center is now more sensitive due to its previous suppression.

Haemostypsis

will appear mainly in the event of fresh injuries bleeding from the capillaries and minor vessels, of flat damaged to the skin coating, where the surgically disrupted adhesions bleed, during the operations on the parenchymatous organs, following a tooth extraction, as the first aid following the bullet and stab wound within the applied compression.

Once a sorptive dressing is placed and slight pressure applied, the spaces between the individual carbon filaments will contract themselves and the capillary forces the blood plasma is exposed to will grow. This will cause an accelerated blood absorption into the carbon sorptive layer. As water, with its small molecules, is easiest to penetrate the carbon netting structure, a major haemoconcentration will take place in the residual space between the wound surface and sorptive layer and/or between its leaves. But there will simultaneously take place a massive contact of the haemocoagulation cascade initializing factors with the carbon waterytable surface. By action of both of these mechanisms the haemocoagulation process is really started up and substantially accelerated due to the above factors.

Note: Where, following the haemostasis, there is no risk of bandage sticking to a dry and healed up wound (wound surface is dry, there is no threat of postponed treatment) the dressing can conveniently be left over and its bacteriostatic and antiphlogistic effects used.

Detoxication

Active charcoal detoxicating effect is a well-proved characteristic throughout the history, widely used e.g. within the alimentary intoxication therapy. In a specific case the aim is to entrap the bacterial toxins, some exogenous toxins coming e.g. from insect stings (aculeus) and endotoxins that arise in the necrotic tissues. In the event of a special micro-filament carbon form the detoxicating effect will come up very fast, being massive. This reflects an extremely specific active area. A transcutaneous extraction of e.g. an insect toxin, even from the deeper skin layers, will take place in the very sense of the word where the watery curing conditions are observed.

Quite particular hopes are associated with application of the large-area BB veils to large burns where a timely application can substantially facilitate the retention of the endogenous decay toxins and prevention of its massive flooding into the circulatory system with all the consequences of a metabolic disintegration...

Anti-inflammatory and locally calming effect

Like in the case of analgesic actions, the inflammatory response modeling where the level of the inflammation mediators (histamine) is reduced, antitoxic effect which helps master the presence of the bacteria toxins, and finally the bacteriostatic effect caused by the wound decontamination come useful even here.

Anti-oedematous effect

Reduced osmolality will come up as a result of the carbon adsorption effect; since the total osmolality of the solution is much reduced, the excessive water is sent back to the circulatory system.

Curing process stimulation

The fact that BB is not only decontaminating the wound, but is literally extracting all the unbound substances from the wound, is at the core of the curing process stimulation. Lacking nutrients and newly arisen "free space" will actually induce a neoangiogenesis, granulation, and epithelization. The matter is that an active dressing will deliver nothing to the body, but provide a clean space where all the natural, body-inherent curing mechanisms can take place, doing so moreover in a harmonious way as it inhibits an imbalance between the individual curing mechanisms.

As a rule, the application of this mechanism implies the fulfillment of the absolutely applicable tenet which defines the very purpose of the physician's efforts, i.e. his/her strive to prepare such conditions in which the body can itself initiate a suitable remedy. As such, the application of an active sorptive dressing should be made available even to the classes of population aimed at natural healing methods, traditional oriental medicine, and as a variety of alternative therapeutic techniques. This natural and ingenuous mechanism which the active double-layer based medical products use to heal the wounds is, in the philosophical terms, quite acceptable even to the most extreme protagonists of the alternative healing methods...

PHASE-BY-PHASE WOUND TREATMENT

Issue of therapeutic schemes

During the past years, a variety of comprehensive, often very sophisticated therapeutic schemes, bound on the particular sets of the efficient modern bandages and therapeutic means, was introduced, though they are not yet, by far, outweighing the “conventional” therapy, being ever more frequently used within the modern treatment of hardly curable wounds and skin coating defects and/or the deeper tissue layer defects. At the core of these schemes, there tends to be the recommendations concerning a series (sometime even plentiful series) of tools, as a rule from the program of a particular manufacturer. Obviously, these recommendations are, in their overwhelming majority, equitable, and their consistent observance support a very favorable course of cure. On the other hand, these schemes have some disadvantages:

- a) need to keep a variety of medical products readily available – depending on the curing process phase. Then, one has to keep relatively extensive records and spend lot of financial funds in order to maintain a completely equipped storage.
- b) ability to distinguish the curing phase in which it is good to apply the new product – in order to choose an optimum step one has to be erudite,

the main matter is that one needs to take a demanding study in order to attain an overall knowledge of what characterizes up to tens of materials and master thus the modern therapy of wounds with specialized materials.

BAUER BANDAGE SET

Knowing the benefits resulting from making such schemes of the standard procedures well-proved in practice and the structure of the materials including all what one needs to be able observe the *lége artis* therapy, BAUER BANDAGE, as the manufacturer, also attempted to compile a kind of comprehensive recommendations in the details reaching beyond the scope of the instructions included. But this time, owing to a broad spectrum of the active double-layer applications, these recommendations come solely from the explanation of the principles for respecting some main rules that have to be heeded where this material is to be used and the recommendations concerning a few auxiliary materials the provide the wound microclimate and protection of the newly arisen epithelium from maceration.

At the outcome there is a simple set of guidelines that make it easier to pick a correct individual treatment process, using the same sophisticated and highly efficient set which, unlike any other sets, uses a much lower number of items and – as such – seems to be clearer and more acceptable in practice.

Our endeavor also is to encourage the adherence to the main tenets necessary for mastering successfully the chronic defect decontamination and curing in relation to the nature of the wound and therapeutic phase just in progress.

One has to check the wound and redress it more frequently in order to safeguard the initial phase of healing. While being decontaminated the wound is producing a relatively large number of undesirable substances that are intensely absorbed by the active layer. With the advancing wound deactivation and its transition to the curing phase one can also prolong the saturation checks and redressing intervals.

In order to keep the wound microclimate intact it is important not to redress optionally the wound each time it has to be examined. Sorptive capacity of the material is enormous and in practice its function can rather be jeopardized by a thick layer of detritus and dense putrid secretion which will cling to the carbon layer contact

surface, clogging the spaces between the carbon filaments, inhibiting thus the proper action of the diffusion pump. But here it is enough to rinse away the macroscopically visible particles with sterile distilled water or with a physiological solution directly at the patient with his bandage left on. At first sight only it may seem as a violation of the proper therapeutic rules to leave the bandage on the wound. Here, our objective is to maintain the wound microclimate as stable as possible and allow thus a smooth cure. Just with the bandage left this condition is fulfilled to a large extent as the full weight of the bandage complete with all its coactive layers has an active involvement in this microclimate. Temperature of the water used to rinse off the carbon layer surface should range between 37 and 40 °C, as otherwise the wound might get chilled and the curing process stopped for hours.

Bandage set composition

1. BAUER BANDAGE covered with the water-impermeable foil layer and heat insulation dressing.
2. Non-aggressive ointment to protect the wound surroundings against excessive maceration.
3. Sterile water or suitable solution for watering the whole set of the dressing.

Use of the above items is clarified in the form of the therapeutic schemes, i.e. the aids that makes it easier to pick an appropriate treatment, depending on the wound/defect type.

AVAILABLE RANGE

Bauer Bandage is made in standard squares sized 10 x 10 cm which can be split any way. Even larger squares are now under considerations, making it possible to treat flat defects with an integral layer of carbon. They should be launched in near future.

On the same base there is also a compress used to treat the insect stings and a plaster for minor wound treatment.

CONTRAINDICATIONS, COMPLICATIONS, AND UNDESIRABLE EFFECTS

Contraindications

The medical products on the basis of ACTIVE BILAYER are not known to have any contraindications. This is obvious from active carbon general characteristics, as this carbon is perceived as an efficient antidote, not ranked among any potential allergens.

Sticking into wound

The most frequent complication being unfortunately encountered in our clinical practice and at home treatment is the active sorptive layer stuck into the wound when it dries up. The carbon micro-filaments can even interleave the newly arisen tissue layers during the curing process.

The causes behind this complication lie in an inadequate wound/defect treatment, mainly where the effort to maintain the watery climate is neglected. Manufacturer is exerting extraordinary efforts to reduce the occurrence of this complication, supporting the educational activities that result in the nursing personnel trainings that are, where possible, held also for the patients themselves. One has to keep in mind the fact that it is an interactive bandage, not a kind of any passively responding dressing, and that it is therefore necessary to carry out frequent visual inspections, mainly in the early phases of the curing process, as the conditions prevailing in the wound might change in time to the conditions suitable for a conventional therapy with much more dynamics.

This treatment error might lead as far as to the damages to the newly arisen tissues or even to their devastation which might occur as a result of an extremely relentless drive to strip off the stuck dressing without adherence to the manufacturer-recommended measures that should result in only minimal damages.

Pigmentation

Carbon pigmentation can arise by action of the active carbon tiny particles released from the micro-filaments, in particular where the bandage is flushed repeatedly and – as such – applied into the wound on a long-time basis. More frequently it can be encountered at a long-time treatment of the chronic wounds and defects. Even though, regarding the overall condition of the skin coating, it is here without any negative aesthetic significance as a rule, as a scar curing takes place here, mostly as early as in the field with increased pigmentation which tends to be evoked by the trophic changes. Despite this, the bandage needs to be replaced without any delay whenever you find out that the carbon particles get released into the wound, as the carbon may irritate mechanically the curing tissue.

Increased sensitivity

Increased sensitivity up to painfulness of the wound may be experienced at the decontamination and stabilizing phase. The reasons rest in revealed loose nerve ends and their increase irritability. Where a satisfactory look of the wound signals a satisfactory curing process underway you should introduce suitable routine measures with an interrupted application so that the patient is not uselessly exposed to pains and make it possible to apply the sorptive dressing on a quite individual basis. Where to be found successful weaker analgesics can be administered on a temporary basis. In the event of the wound that could not be cured successfully for years, the prolongation of the curing process by several days is meaningless.

ADVANTAGES

Treatment by means of the medical products from the BAUER BANDAGE family has been tested both in the clinical conditions and in the field where the basic hygienic conditions could only be maintained with much difficulty. The people living in very poor social conditions, without any basic hygienic usages and knowledge, use these products at their homes without any troubles if they are able to respect the watery dressing maintenance principles, wound surroundings protection principles and at least a level of the macroscopically visible cleanness in the wound, mainly of the carbon contact layer. For most patients it is enough to take some easy training with a practical demonstration and basic instructions for not more than 5 minutes. Then, they are able to master the issue.

Except for the strongly purulent ones where the infection has not yet been put under control with the antibiotics administered, the stabilized wounds do not mostly need any additional decontamination upon their redressing.

The product is environment-friendly and can be disposed along with normal communal wastes, buried (unless being strongly infectious) or incinerated. In the case of its clinical use one has, of course, to observe all the hygienic standards and regulations that deal with hazardous wastes management.

No special nursing capabilities and skills are necessary for good mastering of the work with the medical products from the BAUER BANDAGE family.

Reduced exudate production is experienced at the curing phase and the redressing intervals can be substantially prolonged.

Application of BB will reduce the risk of sepsis or of the secondary complications in the wound.

As the wound curing process evolvement will early fall under control of a nursing person the patient can be sent home after several days in hospital.

You can avoid amputations or other surgical operations, such as skin graft implantations, etc. by applying timely the BAUER BANDAGE.

Advantages in the case of wound treatment at a specialized infirmary

- Single-step application
- Easy availability
- Non-toxic even in the case of incorrect application
- Clean and without admixtures – possible application into wounds without any barriers
- Shape can be perfectly adapted for ideal contact with the wound surface throughout its space
- Stability
- Safety
- Relieves of the wound-caused pains or eases these pains
- Strong deodorizing effect
- Powerful in a wide therapeutic practice
- Can be easily and simply stored for prolonged periods of time
- Reduces the need of simultaneous medication
- Environment-friendly

Home usage advantages

- Multipurpose helper
- Cheap relatively to its effects and broad spectrum of applications
- Available without prescription
- Simple application

More than just a dressing

BAUER BANDAGE is classified as an actively acting medical product, as it not only covers and protects the wound, but also boosts the natural curing process by preparing an optimum climate in the wound. It mainly includes uncovering of the exudate undesirable components by draining them outside the wound. Apart from others, this prepares the conditions which initiate the bacteriostasis. A micro-layer of water is always left on the wound surface. This allows the watery curing processes.

The carbon layer is chemically active, able to bind a spectrum of substances through a so-called "chemosorption", being however fully inert, i.e. not allowing to give rise to any new substances between the active layer and body. These substances would otherwise infiltrate into the inner organism. Except for sterile solutions used to moisturize for keeping the watery curing conditions where it is indicated from the wound nature no auxiliary substances or medicaments are applied locally along with the medical products from the BAUER BANDAGE family.

This product of the natural, vegetal origin will foster the natural processes involved in the physiological healing in an extremely efficient way, preparing the conditions in which the body can help itself.

Availability

The BAUER BANDAGE based medical products are made in the Czech Republic and their price is set so that the product is available in most countries. Since Jan 1, 2007 the product is partly refunded from the General Health Insurance Funds.

In the case of the countries where the international or humanitarian helps are channeled, both the manufacturer and the Czech Republic state authorities will prepare the conditions for wide availability of the BAUER BANDAGE based medical products even there, as well as in the selected poorest and socially handicapped communities.

Wide availability is given by the fact that the proper use will bring much savings on the medicament, germicide, bandage and other material expenses as well as the substantial cuts in wound/defect healing times in case of the defects that would otherwise appear beyond control.

MAIN APPLICATION RULES

Normal surgical treatment rules must be observed during application of BAUER BANDAGE. The following are most important of them:

Tetanic anatoxin 0.5 ml administered to all the patients who were not properly vaccinated.

The patients with deeper purulent wounds shall receive ATB medication, analgetics, steroids, etc.

The patients with chronic non-bleeding and recurring wounds and defects shall undergo the laboratory tests for diabetes mellitus.

All the medical products based on the ACTIVE DOUBLE-LAYER, if they bear the protected trade mark of Bauer Bandage are intended as dispensable, being sterile while their primary package remains undisturbed. Where purposeful and feasible in technical terms you have therefore to observe the sterile treatment rules.

Remove all the foreign bodies and particles.

With the wound attended an active sorptive dressing should be placed without any useless hesitation.

BAUER BANDAGE must be in direct contact with the whole surface of the wound.

Should the BAUER BANDAGE be applied, obtain a suitable hypo-allergenic sticking tape or a piece of foil impermeable for the self-sticking water with a suitable type of the heat insulating and fixation bandage.

Mainly in the case of the application it is good to watch the outer surface of BAUER BANDAGE (surface of the diffusive and active layer). If this layer (or only a part of it) gets colored from beneath, carbon sorptive capacity is used up and the dressing must be replaced. The wound that initially produce large quantities of exudate will first require continuous inspections and shorter redressing intervals of ca 6 – 12 hours, but the exemptions from the rule can be found even here.

Providing the adherence to the watery therapy rules the BAUER BANDAGE can be left even for several days; vital here is the extent to which the sorptive capacity is exhausted and contamination of the carbon filament contact layer.

Redressing (dressing replacement) is easy with BAUER BANDAGE, following the same steps as within the first application.

It is not necessary to decontaminate the wound once again, barring where severe purulent secretion still endures or where the necrotic tissue portions are newly demarcated. An extraordinarily thick pus might be the cause behind the worsened function of the diffusion pump and reduced efficiency, but this case is worthy of our considerations only rarely.

Without any concern the patients may remove the BAUER BANDAGE dressing, without risking any infection, if they have been instructed in the fundamental knowledge. This treatment method has already been applied routinely to thousands of patients in many different environments

Should any unexpected responses or occurrences appear in connection with the BAUER BANDAGE application, a physician must intervene in order to ward off the consequences of a wrong BAUER BANDAGE application. For example: The wound fails to cure; a liquid rim arisen around the wound; the wound edges are edematous and reddish, etc.

INDICATIONS

Diabetics' injuries

The people exposed to diabetes threats should protect themselves from injuries with extraordinary care as their wounds tend to cure slower, taking often the forms of complicated non-bleeding chronic defects.

Unfortunately, where these serious conditions are underestimated and allowed to occur, this negligence often results in limb amputations.

BAUER BANDAGE is tried as an extraordinarily useful helper just in the case of diabetics' injuries:

It is very important to diagnose the type of wound in time, even when at the stage of skin surface damages. The sooner you commence the therapy by means of BAUER BANDAGE, the easier will be the wound curing process. These wounds that feature irregular behavior often lack any tendency to cure at all without intense therapy – all too many diabetics have realized this unfortunate fact too late...

The blood sugar level has to be properly monitored and kept within the physiological limits.

Before commencing any treatment with BAUER BANDAGE, you have to make the wound subject to thorough toilet and/or revitalization (debridement). A specialist must examine the wound and consider any presence of infection, and commit the corresponding ATB therapy where necessary.

Incisions

When sized properly, BB can conveniently be used for dressing primarily the incision once the surgical operation is over, mainly where there is an increased risk of the wound dehiscence (presence of microbial infection revealed per-operationally).

In surgery the advantage of BAUER BANDAGE rests in its ability to reduce occurrence of the postoperative sepsis, mainly in the event of very risky cases. Logically, it also helps avoid infectious disintegration of the wounds in any case. This is a serious complication which often results in a prolonged hospitalization, necessity to commit antibiotics, increased pains, and patient sufferings. Economic benefits of the standard BAUER BANDAGE usage for the wound primary dressing can be assessed very easily in any facility.

The wound can be left dressed until the outer surface of the diffusion supporting layer of BAUER BANDAGE gives evidence of that the sorptive capacity of the carbon fabric is used up. The wound need not be decontaminated or disinfected either way during the BAUER BANDAGE redressing. Many surgeons are used to redress the wound on the 2nd or 3rd postoperative day. Nothing at all can be objected here. But nevertheless, the practical experience is that as soon as a surgeon starts using BAUER BANDAGE and finds out the progress of the curing process on a few patients, his need to undress the wound relatively often gets much reduced and he will gradually confine his activities to mere visual inspection of the double-layer outer surface. Any change can therefore be viewed here as a very sensitive indicator of a pending complication... One of the key characteristics of BAUER BANDAGE application is a reduced number of the inflammatory elements in the suture line. This, in its very essence, will reduce the risk of a secondary infection.

Here, Bauer Bandage acts as a helper able to reduce substantially the occurrence of postoperative sepsis, protecting the patients and saving the money of the insured. And what's most important: the product will reduce the risk of postoperative sepsis and related complications for every individual patient.

Burns

Once the first aid, mainly the thorough cooling with cold water, is provided, the BAUER BANDAGE can be used to treat the burns at all their levels, regardless of the Level III which first requires a surgical treatment of the wound within which the eschar (scab) has to be removed. But as soon as this type of burn is relieved of its necrotic tissues, BAUER BANDAGE can be applied.

BAUER BANDAGE should never stick to the wound – the wound has to be kept moist any time and this will prevent sticking.

When caused by chemicals the burns must be rinsed thoroughly with running water before the BAUER BANDAGE treatment is started up. In case of large burns adequate compensation for the lost liquids and proteins has to be provided.

Blisters must be relieved of their covers as early as possible in favor of the conditions ideal for epithelium restoration. When left in their covers blisters would inhibit the action of the BAUER BANDAGE effect. Curing process will run much quicker where the necrotic cover has been removed, being well-balanced as soon as the exudate is drawn off the blister.

Ulcers

BAUER BANDAGE is used in case of the dermal ulcers of all types, acute and chronic ones. This is none of the miraculous recoveries. The reason is that an ulcer is a chronic formation. Even though a minor one, an error can creep easily in while such an ulcer is healed. When the error persists, it may result in a long-term non-curability. Biology of some outdated ulcers is changed by a surviving vicious circle. A minor change is often enough to interrupt the vicious circle; BAUER BANDAGE can facilitate the curing process everywhere provided that the curability potential remains kept. ...

An overall sepsis is not a kind of contraindication for the BAUER BANDAGE applications which will here only facilitate the process of getting it under control with antibiotics and concurrent neutralization of the primary bed.

Any pain that may appear during the BAUER BANDAGE application can only signal the onset of the right BAUER BANDAGE function. Advise the patient to try to ease his pain by suspending the application and the process with the analgesic application or by means of the physical devices that help ease the pains. If there appear any clear signs of curing within several days, you have to endure in contrast to the existing history of your recovery attempts. In accordance with what we have experienced, full recovery will follow in 95 % of the cases, even though incurable until then.

BAUER BANDAGE can also be applied into the deep defects. Then, the sorptive layer has to line the whole concavity of the defect which has then to be filled in with a moisture keeping auxiliary tampon made from a cotton wool or a soft non-woven fabric.

Bites

Animal bites (but also bites by man) presume a thorough rinsing of the wound in order to relieve it of saliva and contamination before the BAUER BANDAGE is applied. Analgetics can be applied along with an overall ATB therapy at the initial phase. Where the animal which has caused the bite is suspect of suffering rabies, the relevant therapy has to be commenced. BAUER BANDAGE is applied in compliance with a routine standard treatment, such as a kind of dressing; the earlier it is tackled, the better. Adequate re-vaccination is also a part of the therapy.

The spider venom is known as a substance with an extraordinary long, delayed effect, giving rise to extensive necrotizing wounds, often with effects that can sometimes be called devastating. BAUER BANDAGE is able to reduce the advance of this extraordinarily devastating damage escalation.

In any case, however, it is important not to rely solely on BAUER BANDAGE, but to take all the standard measures and curative actions, such as the corticoid, ATB, ... administration in larger amounts, with all the responsibility and consistency. The same principles will have to be applied after snake bites, venomous fish

and other sea animal bites, in case of mite/insect bites. Venomous insect stings must be chilled, so that the local blood circulation is restricted and the organism responses to the venom slowed down. This will reduce damages to tissues.

If you apply BAUER BANDAGE to the wound from a venomous spider bite where the venom has already caused some necrosis, one has to realize that the curing process will include the necrosis demarcation and separation. In these cases, BAUER BANDAGE often has the effect which will virtually “enlarge” the wound.

Bites at the sea, injuries from sea animals, jelly fish, etc.: Injured part of the body must be plunged in hot water as soon as possible; the water must be as hot as the patient is able to withstand. Sea animal venoms only act at the temperatures not more than some 25°C; any higher temperatures will denature the venomous proteins very quickly, inactivating them thereby; this procedure will immediately reduce the scope of damage and eliminate pains. Any necrotic tissue will have to be removed surgically before BAUER BANDAGE is applied.

Finger and toe tip injuries

This BAUER BANDAGE application will give superb results, being cordially recommended as a treatment standard in the case of all finger and toe tip injuries. Simple BAUER BANDAGE application to the injuries of this type and the possibility to redress the wound easily and properly right at home poses a very efficient treatment method applicable to these injuries. Unique properties of this dressing pose some good preconditions for recovery of the properly formed nail bed and good quality of the future nail in the event of a variety of different injury types. Using the BAUER BANDAGE within this application will make it possible to reduce the necessity of repeated corrective surgical actions. This makes the method not only efficient, but also cheap way of treatment.

Decubitus

Any devitalized (died away, necrotic) tissue must first be removed surgically before the treatment with BAUER BANDAGE is started up. Deep defects and voids inside the decubitus must be fully filled with BAUER BANDAGE for the immediate contact between the sorptive layer and wound surface throughout its surface. Deep defects have to be redressed much more frequently and flushed with a physiological solution where a putrid secretion persists on their surface. It is not appropriate to exert any pressure on the wound surface as this would only support devitalization. Use of a circular cushion or better a mat of a slightly inflated small motorcycle tire tube. Elimination of any direct pressure on the wound and positioning the patient implies a key condition for quick recovery...

Do not terminate the BAUER BANDAGE treatment unless the defect is fully recovered.

Carcinoma

BAUER BANDAGE can safely be used to treat the patients with decomposed, secondarily infected surface tissue defects arisen as a result of tumor proliferation. Here, BAUER BANDAGE can eliminate odor, remove the inflammatory symptoms, and ease pains, but, obviously, not to heal up the malignity.

AIDS infection resulted defects

In case of the patients who suffer the AIDS symptoms one can achieve a substantial easement of pains and relieve the immune system of its burdens. Obviously, these patients must be medicated with specific drugs – antibiotics, antivirals, etc.

BAUER BANDAGE IN YOUR MEDICINE CHEST

first aid

Fresh bleeding injuries

In case of fresh wound the main effect of BAUER BANDAGE is haemostasis and bacteriostasis. Here the BAUER BANDAGE is first applied as a compressive dressing as it can quickly stop any further bleeding. Fast action, by the way like with the following examples of venomous bites, is a base of any further success, as the quick application will reduce here the blood loss and suppresses escalation of pains. Here, the BAUER BANDAGE can be removed, as soon as the patient is transported to a specialized infirmary (outpatient department, operating unit). Extraordinary speed of its action makes the BAUER BANDAGE the best choice of applications in case of small and serious injuries.

Venomous stings, bites

This is one of the BAUER BANDAGE unique applications, as there is any a minimum of the market-available medical means that can be used efficiently in this field. Thanks to that the suction effect of BAUER BANDAGE prevails over the pressure in the blood capillaries and system of veins, BAUER BANDAGE act as a tool able to hinder the venom proliferation through the circulatory system. There is ample experience with insect stings (bees, wasps, bumblebees, hornets), isolated experience with venomous spider bites, certain limited experience with snake bites, and a wide experience with animal or human bites.

Furuncles and carbuncles

When applied to furuncles and carbuncles BAUER BANDAGE will give excellent results. Furuncle has to be drained out and all its necrotic tissues removed. An appropriate ATB therapy has to be applied where an infection seems to proliferate. Further advance with BAUER BANDAGE application until the skin is fully recovered.

Small-scale burns, cuts, and other minor injuries

Advance in accordance with the BAUER BANDAGE general user instructions available as a part of every package.

Panaritium

Nail bed infections often tend to become small, but extremely persistent and painful abscesses. These tend to be drained and treated with antibiotic medication; here the BAUER BANDAGE is applied as a standard dressing in compliance with routine practice.

Blisters

Remove the separated layer of epidermis or tear the blister surface quite away before applying BAUER BANDAGE. Here, the unique screen will prevent the sorptive layer to get stuck to the blister bottom. Removal of the blister cover layer will protect from the insect risk and allow the quick restoration of the fully valued skin coating.

VENOUS ULCERATION

Ulcus cruris

RECOMMENDED FRAMEWORK FOR TREATMENT PROCEDURE

with the use of Bauer Bandage medical device (hereinafter BB)

The text is an introduction into the issue of treatment of the aforementioned type of tissue defect. The text contains basic information and recommendations for application of sorption cover based on activated micro-filament carbon the effect of which is potentiated by the presence of diffusion activity additional composite layer in the form of unwoven textile made of a pre-defined fibre mix.

The BB sorption covering based on activated carbon is suitable for treatment of venous ulcers regardless of the aetiology of their origin. From freshly opened small defects to seemingly non-healing conditions of several years.

Treatment with active cover with direct contact between the carbon layer and the tissue defect surface differs in several regards from the generally accepted wound treatment principles under the conditions of classic asepis. Therefore we believe it is necessary to point out the main differences.

Condition of permanent maintenance of aqueous solution environment (the so-called “watery wound healing”)

To enable the utilisation of the BB sorption capability in the treatment of a chronic defect to the full degree and long-term it is necessary to ensure and, for the entire duration of treatment, maintain the sorption cover mass in the aqueous solution liquid phase environment. If using the nursing practice set terminology, this is an application rather than a bandage. In practice, this means continuous supply of sterile distilled water or other suitable sterile, ideally colourless, aqueous solution (physiologic solution, hydrogen peroxide) through repeated spraying or careful pouring from the outer side of the diffusely active or auxiliary sorption outer layer of BB (the white layer of the covering unwoven textile) to compensate the evaporation or other losses by water supply. At the same time, it is unnecessary and, in many cases, not desirable to uncover the surface of the defect when supplying water since this disturbs the healing process. The aforementioned procedure does not create the threat of introducing other infectious agents into the wound. The co-operation between the sorption and diffusely active layers forms an efficient barrier against microbes entering the bottom of the defect from outside. The diffusely active layer ensures concentration gradient with the “pump” effect from the surface of the defect; moreover, the sorption layer would retain the majority of infectious agents. The agents that might possibly reach the surface of the wound will not, if the sorption cover is applied correctly, find enough nutrients necessary for reproducing.

Cover exchange indication

An imperative impetus to exchange the BB cover is (while observing the previous principle strictly) the depletion of the active carbon layer sorption capacity. This occurs in dependence on the quantity of the agents absorbed, their character, exudation dynamism and exudates character. The depletion of the sorption capacity is indicated by the colouring of the top, diffusely active, layer of the unwoven textile. If any substances from the wound are entering the layer through the carbon layer and discolouring it (blood, albumin, pus etc.) it is necessary to exchange the cover immediately since it is not functional in this condition. With respect to the fact that the most frequent discolouration is yellow (exudates, tissue fluid) it is not recommended to use colourful solutions for moistening the BB cover (e.g. the yellow Ringer solution) in such cases (exchange of cover based on visual assessment) since their application makes correct assessment of the sorption capacity stage difficult. The possibility of checking the state of the active cover of the defect based on BB is valid when

the defect is under intensive, continuous control of the nurse and exchange of cover can be reliably and timely indicated through finding out the penetration of unwanted substances above the carbon layer.

In all other cases the BB is applied within the recommended scheme of wound treatment and exchange of sorption cover is regulated by the time schedule as stipulated in the scheme, in the manufacturer's detailed manual for covers with differentiated thicknesses of sorption layers made of unwoven textile. In such cases colourful solutions may be used. The scheme calculates a sufficient time reserve before using up the sorption capacity. The defect must be paid more attention in the introductory stage of therapy when the demands for cover exchange as well as water supply are higher. Each defect must be viewed individually and looked after intensely and carefully until the nurse is sure that the wound has been cleaned, local infections managed and the defect has been generally stabilised with transition to the healing stage – only then is it possible to adopt the routine of one of the recommended schemes.

Visual check of the effect

It is necessary to bear in mind that by applying BB we are not applying the classic "sterile" cover but that this is another (material) active element in the complex therapy. Due to the "activity", the introductory stage of treatment lasts significantly shorter compared to other materials used, that is, depending on the character and scope of the defect, from several tens of seconds or a few minutes (when stopping bleeding in fresh wounds) to several tens of minutes to a few hours (for trophic defects, infected wounds, in tissue detoxication). Therefore it is recommended to uncover, at least partially, the BB layer at the end of application and check visually how the defect responds to application of BB. It is not rare that even after a few minutes the eye can see an effect resulting in the reduction of the swelling, disappearance of surrounding erythema and other signs of inflammation (if they had been there before). This effect discovered through an early check is the first sign that the treatment has been applied correctly and the mechanism of sorption potentiated by osmosis has been started effectively.

Primary treatment

1. Perform careful mechanical cleaning of the defect including the removal of demarcated necrosis, drain exudates.
2. Treat the unaffected skin around the venous ulcer preventively against maceration by applying a thin layer of a suitable indifferent ointment.
3. By soaking the BB in a bowl of a suitable sterile solution, saturate the BB fully with the solution - carefully wring small air bubbles out of all BB layers under the surface of the solution. If the defect is a deeper one adapt the BB carefully by cutting the edges off to allow putting it in the defect without creating areas with no contact or even spaces filled with air (in the case of deeper defects, the treatment assumes the character of a "tamponade").
4. Carefully press the BB against the bottom of the venous ulcer, trying not to cause pain to the patient. Make sure again that no air was left between the sorption layer and the surface of the defect that would prevent the active cover from its proper function.
5. With a syringe, supply solution to the outer diffusely active or auxiliary water-retaining layer of BB since some of the solution could have been extracted by the previous manipulation.
6. Leave the treated defect for 2 to 3 minutes. Make sure that the patient is not complaining about increased pain resulting from the contact of the defect with the BB carbon layer. After several minutes, take off a corner of the BB with tweezers and check the condition of the defect. Check whether there has been any air retention under the sorption layer and try to assess the response of the bottom of the burn and its immediate surroundings (colour, oedema). After removing the possible faults from the perspective

of presence of air, adhesion etc. and finding out that the tissue does not respond in an undesired manner cover the entire defect again and proceed to the final step in the treatment.

7. Fix the BB while using light covering with a dry, permeable sterile material (where a cover layer of unwoven textile is not part of BB, add sterile gauze compresses etc.) and ensure light fixation (plaster, gauze bandage).

Re-bandage

1. By taking off a corner of the BB in a careful manner, make sure that the active carbon layer has not adhered (stuck) to the surface of the venous ulcer. That alone is always an alarming sign of insufficient continuous solution supply and breach of the rule of treating the venous ulcer in a watery environment.
2. If such a complication is not discovered, proceed identically to the initial treatment in all steps. Pay special attention to manipulation with the BB, both with the cover with the depleted sorption capacity when taking it off and with the freshly applied cover. Take care not to disturb the newly formed granulations or the delicate layer of epithelium by insensitive manipulation.
3. If a complication in the sense of increased adhesion (sticking) of the BB to the bottom of the defect, discontinue the attempts at taking the sorption cover off immediately and repeatedly supply a suitable sterile solution to the surface of the cover. Wait for several tens of minutes until the BB is released from the bottom. Only afterwards take it off, very carefully. Then proceed identically to the initial treatment.
4. If local signs of microbial inflammation remain in the defect even after three days from the initial application of BB, consider the application of a generally taken antibiotic or a modification of the ATB therapy so far in accordance with the result of microbiological examination for cultivation and sensitivity.
5. Carry out re-bandaging according to the character and development of the defect, initially after approx. 6 hours while gradually extending the intervals to the frequency of once in three days or longer.

With respect to the scope of the indication spectrum of the aforementioned material, extraordinary demands are put on the nurse with regards individual assessment of the wound (tissue defect) development while applying the active sorption cover and, therefore, the instruction text cannot fully replace the therapist's own erudition.

DIABETIC NECROSIS

Necrosis diabetica

RECOMMENDED FRAMEWORK FOR TREATMENT PROCEDURE

with the use of Bauer Bandage medical device (hereinafter BB)

The text is an introduction into the issue of treatment of the aforementioned type of necrosis. The text contains basic information and recommendations for application of sorption cover based on activated micro-filament carbon the effect of which is potentiated by the presence of diffusion activity additional composite layer in the form of unwoven textile made of a pre-defined fibre mix.

The BB sorption covering based on activated carbon is suitable for treatment of diabetic necrosis on DK and the treatment of post-amputation stubs in amputations indicated within the framework of diabetes complications (diabetic leg syndrome).

Treatment with active cover with direct contact between the carbon layer and the tissue defect surface differs in several regards from the generally accepted wound treatment principles under the conditions of classic asepsis. Therefore we believe it is necessary to point out the main differences.

Condition of permanent maintenance of aqueous solution environment (the so-called “watery wound healing”)

To enable the utilisation of the BB sorption capability in the treatment of a diabetic defect to the full degree and long-term it is necessary to ensure and, for the entire duration of treatment, maintain the sorption cover mass in the aqueous solution liquid phase environment. If using the nursing practice set terminology, this is an application rather than a bandage. In practice, this means continuous supply of sterile distilled water or other suitable sterile, ideally colourless, aqueous solution (physiologic solution, hydrogen peroxide) through repeated spraying or careful pouring from the outer side of the diffusely active or auxiliary sorption outer layer of BB (the white layer of the covering unwoven textile) to compensate the evaporation or other losses by water supply. At the same time, it is unnecessary and, in many cases, not desirable to uncover the surface of the defect when supplying water since this disturbs the healing process. The aforementioned procedure does not create the threat of introducing other infectious agents into the wound. The co-operation between the sorption and diffusely active layers forms an efficient barrier against microbes entering the bottom of the defect from outside. The diffusely active layer ensures concentration gradient with the “pump” effect from the surface of the defect; moreover, the sorption layer would retain the majority of infectious agents. The agents that might possibly reach the surface of the wound will not, if the sorption cover is applied correctly, find enough nutrients necessary for reproducing.

Cover exchange indication

An imperative impetus to exchange the BB cover is (while observing the previous principle strictly) the depletion of the active carbon layer sorption capacity. This occurs in dependence on the quantity of the agents absorbed, their character, exudation dynamism and exudates character. The depletion of the sorption capacity is indicated by the colouring of the top, diffusely active, layer of the unwoven textile. If any substances from the wound are entering the layer through the carbon layer and discolouring it (blood, albumin, pus etc.) it is necessary to exchange the cover immediately since it is not functional in this condition. With respect to the fact that the most frequent discolouration is yellow (exudates, tissue fluid) it is not recommended to use colourful solutions for moistening the BB cover (e.g. the yellow Ringer solution) in such cases (exchange of cover based on visual assessment) since their application makes correct assessment of the sorption capacity stage difficult. The possibility of checking the state of the active cover of the defect based on BB is valid when

the defect is under intensive, continuous control of the nurse and exchange of cover can be reliably and timely indicated through finding out the penetration of unwanted substances above the carbon layer.

In all other cases the BB is applied within the recommended scheme of wound treatment and exchange of sorption cover is regulated by the time schedule as stipulated in the scheme, in the manufacturer's detailed manual for covers with differentiated thicknesses of sorption layers made of unwoven textile. In such cases colourful solutions may be used. The scheme calculates a sufficient time reserve before using up the sorption capacity. The defect must be paid more attention in the introductory stage of therapy when the demands for cover exchange as well as water supply are higher. Each defect /amputation stub must be viewed individually and paid intense and careful attention until the nurse is sure that the post-surgery wound has healed or the operation wound area has been cleaned after the removal of necrotic tissues, management of local infection and general stabilisation with a transition to the healing stage – only then is it possible to adopt the routine of one of the recommended schemes.

Visual check of the effect

It is necessary to bear in mind that by applying BB we are not applying the classic "sterile" cover but that this is another (material) active element in the complex therapy. Due to the "activity", the introductory stage of treatment lasts significantly shorter compared to other materials used, that is, depending on the character and scope of the defect, from several tens of seconds or a few minutes (when stopping bleeding in fresh wounds) to several tens of minutes to a few hours (for trophic defects, infected wounds, in tissue detoxication). Therefore it is recommended to uncover, at least partially, the BB layer at the end of application and check visually how the defect responds to application of BB. It is not rare that even after a few minutes the eye can see an effect resulting in the reduction of the swelling, disappearance of surrounding erythema and other signs of inflammation (if they had been there before). This effect discovered through an early check is the first sign that the treatment has been applied correctly and the mechanism of sorption potentiated by osmosis has been started effectively.

Primary treatment

1. Perform careful mechanical cleaning of the amputation stub or defect, in the latter case including taking off the demarcated necrosis, drain exudates.
2. Treat the unaffected skin around the wound/defect preventively against maceration by applying a thin layer of a suitable indifferent ointment.
3. By soaking the BB in a bowl of a suitable sterile solution, saturate the BB fully with the solution - carefully wring small air bubbles out of all BB layers under the surface of the solution. If the defect is a deeper one adapt the BB carefully by cutting the edges off to allow putting it in the defect without creating areas with no contact or even spaces filled with air (in the case of deeper defects, the treatment assumes the character of a "tamponade").
4. Carefully press the BB against the bottom of the defect, trying not to cause pain to the patient. Make sure again that no air was left between the sorption layer and the surface of the defect that would prevent the active cover from its proper function.
5. With a syringe, supply solution to the outer diffusely active or auxiliary water-retaining layer of BB since some of the solution could have been extracted by the previous manipulation.
6. Make sure that the patient is not complaining about increased pain resulting from the contact of the defect with the BB carbon layer. After several minutes, take off a corner of the BB with tweezers and check the condition of the defect. Check whether there has been any air retention under the sorption layer and try to assess the response. After removing the possible faults from the perspective of

presence of air, adhesion etc. and finding out that the tissue does not respond in an undesired manner cover the entire defect again and proceed to the final step in the treatment.

7. Fix the BB while using light covering with a dry, permeable sterile material (where a cover layer of unwoven textile is not part of BB, add sterile gauze compresses etc.) and ensure light fixation (plaster, gauze bandage).

Re-bandaging

1. By taking off a corner of the BB in a careful manner, make sure that the active carbon layer has not adhered (stuck) to the surface of the defect. That alone is always an alarming sign of insufficient continuous solution supply and breach of the rule of treating the defect in a watery environment.
2. If such a complication is not discovered, proceed identically to the initial treatment in all steps. Pay special attention to manipulation with the BB, both with the cover with the depleted sorption capacity when taking it off and with the freshly applied cover.
3. If a complication in the sense of increased adhesion (sticking) of the BB to the bottom of the defect, discontinue the attempts at taking the sorption cover off immediately and repeatedly supply a suitable sterile solution to the surface of the cover. Wait for several tens of minutes until the BB is released from the bottom. Only afterwards take it off, very carefully. Then proceed identically to the initial treatment.
4. If local signs of microbial inflammation remain in the defect even after three days from the initial application of BB, consider the application of a generally taken antibiotic or a modification of the ATB therapy so far in accordance with the result of microbiological examination for cultivation and sensitivity.
5. Carry out re-bandaging according to the character and development of the stub healing, initially approximately every 24 hours while extending the intervals between exchanges of sorption covers to the frequency of once every three days or longer.

With respect to the scope of the indication spectrum of the aforementioned material, extraordinary demands are put on the nurse with regards individual assessment of the wound (tissue defect) development while applying the active sorption cover and, therefore, the instruction text cannot fully replace the therapist's own erudition.

BURN

Combustio

RECOMMENDED FRAMEWORK FOR TREATMENT PROCEDURE

with the use of Bauer Bandage medical device (hereinafter BB)

The text is an introduction into the issue of treatment of the aforementioned type of wound - tissue defect. The text contains basic information and recommendations for application of sorption cover based on activated micro-filament carbon the effect of which is potentiated by the presence of diffusion activity additional composite layer in the form of unwoven textile made of a pre-defined fibre mix.

The BB sorption covering based on activated carbon is suitable for treatment of a wide spectrum of burns of all degrees from seemingly minor injuries to life-threatening conditions when a significant proportion of skin is affected (e.g. attempted suicide of the so-called living torch).

Treatment with active cover with direct contact between the carbon layer and the surface of the wound - tissue defect differs in several regards from the generally accepted wound treatment principles under the conditions of classic asepsis. Therefore we believe it is necessary to point out the main differences.

Condition of permanent maintenance of aqueous solution environment (the so-called "watery wound healing")

To enable the utilisation of the BB sorption capability in the treatment of a chronic defect to the full degree and long-term it is necessary to ensure and, for the entire duration of treatment, maintain the sorption cover mass in the aqueous solution liquid phase environment. If using the nursing practice set terminology, this is an application rather than a bandage. In practice, this means continuous supply of sterile distilled water or other suitable sterile, ideally colourless, aqueous solution (physiologic solution, hydrogen peroxide) through repeated spraying or careful pouring from the outer side of the diffusely active or auxiliary sorption outer layer of BB (the white layer of the covering unwoven textile) to compensate the evaporation or other losses by water supply. At the same time, it is unnecessary and, in many cases, not desirable to uncover the surface of the burn when supplying water since this disturbs the healing process. The aforementioned procedure does not create the threat of introducing other infectious agents into the wound. The co-operation between the sorption and diffusely active layers forms an efficient barrier against microbes entering the bottom of the defect from outside. The diffusely active layer ensures concentration gradient with the "pump" effect from the surface of the defect; moreover, the sorption layer would retain the majority of infectious agents. The agents that might possibly reach the surface of the wound will not, if the sorption cover is applied correctly, find enough nutrients necessary for reproducing.

Cover exchange indication

An imperative impetus to exchange the BB cover is (while observing the previous principle strictly) the depletion of the active carbon layer sorption capacity. This occurs in dependence on the quantity of the agents absorbed, their character, exudation dynamism and exudates character. The depletion of the sorption capacity is indicated by the colouring of the top, diffusely active, layer of the unwoven textile. If any substances from the wound are entering the layer through the carbon layer and discolouring it (blood, albumin, pus etc.) it is necessary to exchange the cover immediately since it is not functional in this condition. With respect to the fact that the most frequent discolouration is yellow (exudates, tissue fluid) it is not recommended to use colourful solutions for moistening the BB cover (e.g. the yellow Ringer solution) in such cases (exchange of cover based on visual assessment) since their application makes correct assessment of the sorption capacity stage difficult. The possibility of checking the state of the active cover of the wound based on BB is valid when

the wound is under intensive, continuous control of the nurse and exchange of cover can be reliably and timely indicated through finding out the penetration of unwanted substances above the carbon layer.

In all other cases the BB is applied within the recommended scheme of wound treatment and exchange of sorption cover is regulated by the time schedule as stipulated in the scheme, in the manufacturer's detailed manual for covers with differentiated thicknesses of sorption layers made of unwoven textile. In such cases colourful solutions may be used. The scheme calculates a sufficient time reserve before using up the sorption capacity. The burn must be paid more attention in the introductory stage of therapy when the demands for cover exchange as well as water supply are higher. Each burn must be viewed individually and intensely monitored until the nurse is sure of its degree and other characteristics - only then is it possible to adopt the routine of one of the tested schemes.

Visual check of the effect

It is necessary to bear in mind that by applying BB we are not applying the classic "sterile" cover but that this is another (material) active element in the complex therapy. Due to the "activity", the introductory stage of treatment lasts significantly shorter compared to other materials used, that is, depending on the character and scope of the defect, from several tens of seconds or a few minutes (when stopping bleeding in fresh wounds) to several tens of minutes to a few hours (for trophic defects, infected wounds, in tissue detoxication). Therefore it is recommended to uncover, at least partially, the BB layer at the end of application and check visually how the wound/defect/burn responds to application of BB. It is not rare that even after a few minutes the eye can see an effect resulting in the reduction of the swelling, disappearance of surrounding erythema and other signs of inflammation (if they had been there before). This effect discovered through an early check is the first sign that the treatment has been applied correctly and the mechanism of sorption potentiated by osmosis has been started effectively.

Treatment procedure in first aid

1. Put the BB cover on the surface of the burn as soon as possible. This is a "race against the time" therefore do not linger on adaptation of shape or other minor modifications. Use a dimension of BB or several pieces to cover the entire surface even with possible overlaps.
2. Saturate all layers of BB in advance with sterile distilled water or physiologic solution. In case of utmost emergency use drinking water but in such a case, first put the BB on the burn and then pour water from outside through the cover and diffusely active, white unwoven textile layers. Use excessive quantities of the solution to profoundly soak all BB layers.
3. Carefully press the soaked BB against the surface of the wound, trying not to cause pain to the patient. Make sure again that no air was left between the sorption layer and the surface of the burn that would prevent the active cover from its proper function.
4. Supply solution from the top again since some of the solution could have been extracted by the previous manipulation.
5. Put a permeable protective dry sterile layer on top of the BB cover and transport the patient to the initial treatment.
6. Simultaneously, perform all standard anti-shock measures and actions aiming at stabilising the internal environment (infusion therapy, analgetics, antibiotics, corticoids etc.).

Primary treatment

1. Perform careful mechanical cleaning of the wound including the removal of necrotised skin cover (bulla) or demarcated necrosis, drain excessive tissue fluid accumulated under the necrotised layers.

2. Treat the unaffected skin around the burn preventively against maceration by applying a thin layer of a suitable indifferent ointment.
3. By soaking the BB in a bowl of a suitable sterile solution, saturate the BB fully with the solution - carefully wring small air bubbles out of all BB layers under the surface of the solution. If the defect is a deeper one adapt the BB carefully by cutting the edges off to allow putting it in the defect without creating areas with no contact or even spaces filled with air (in the case of deeper defects, the treatment assumes the character of a "tamponade").
4. Carefully press the BB against the bottom of the burn, trying not to cause pain to the patient. Make sure again that no air was left between the sorption layer and the surface of the defect that would prevent the active cover from its proper function.
5. With a syringe, supply solution to the outer diffusely active or auxiliary water-retaining layer of BB since some of the solution could have been extracted by the previous manipulation.
6. Leave the treated burn for 2 to 3 minutes. Make sure that the patient is not complaining about increased pain resulting from the contact of the defect with the BB carbon layer. After several minutes, take off a corner of the BB with tweezers and check the condition of the defect. Check whether there has been any air retention under the sorption layer and try to assess the response of the bottom of the burn and its immediate surroundings (colour, oedema). After removing the possible faults from the perspective of presence of air, adhesion etc. and finding out that the tissue does not respond in an undesired manner cover the entire burn again and proceed to the final step in the treatment.
7. According to the location and scope of the burn, carry out fixation of the BB with the use of light cover with a dry permeable sterile material (where a cover layer of unwoven textile is not part of BB, add sterile gauze compresses etc.) and ensure light fixation (plaster, gauze bandage for the relevant location).

Re-bandaging

1. By taking off a corner of the BB in a careful manner, make sure that the active carbon layer has not adhered (stuck) to the surface of the burn. That alone is always an alarming sign of insufficient continuous solution supply and breach of the rule of treating the burn in a watery environment.
2. If such a complication is not discovered, proceed identically to the initial treatment in all steps. Pay special attention to manipulation with the BB, both with the cover with the depleted sorption capacity when taking it off and with the freshly applied cover. Take care not to disturb the newly formed granulations or the delicate layer of epithelium by insensitive manipulation.
3. If a complication in the sense of increased adhesion (sticking) of the BB to the bottom of the wound, discontinue the attempts at taking the sorption cover off immediately and repeatedly supply a suitable sterile solution to the surface of the cover. Wait for several tens of minutes until the BB is released from the bottom. Only afterwards take it off, very carefully. Then proceed identically to the initial treatment.
4. If local signs of microbial inflammation remain in the wound, consider the application of a generally taken antibiotic or a modification of the ATB therapy so far in accordance with the result of microbiological examination for cultivation and sensitivity.
5. Carry out re-bandaging according to the character and development of the burn, initially after approx. 6 hours while gradually extending the intervals to the frequency of once in three days or longer.

With respect to the scope of the indication spectrum of the aforementioned material, extraordinary demands are put on the nurse with regards individual assessment of the wound (tissue defect) development while applying the active sorption cover and, therefore, the instruction text cannot fully replace the therapist's own erudition.

BEDSORES

Decubitus

RECOMMENDED FRAMEWORK FOR TREATMENT PROCEDURE with the use of Bauer Bandage medical device (hereinafter BB)

The text is an introduction into the issue of treatment of the aforementioned type of tissue defect. The text contains basic information and recommendations for application of sorption cover based on activated micro-filament carbon the effect of which is potentiated by the presence of diffusion activity additional composite layer in the form of unwoven textile made of a pre-defined fibre mix.

The BB sorption covering based on activated carbon is suitable for treatment of bedsores of all degrees and depths.

Treatment with active cover with direct contact between the carbon layer and the tissue defect surface differs in several regards from the generally accepted wound treatment principles under the conditions of classic asepsis. Therefore we believe it is necessary to point out the main differences.

Condition of permanent maintenance of aqueous solution environment (the so-called “watery wound healing”)

To enable the utilisation of the BB sorption capability in the treatment of a trophic defect to the full degree and long-term it is necessary to ensure and, for the entire duration of treatment, maintain the sorption cover mass in the aqueous solution liquid phase environment. If using the nursing practice set terminology, this is an application rather than a bandage. In practice, this means continuous supply of sterile distilled water or other suitable sterile, ideally colourless, aqueous solution (physiologic solution, hydrogen peroxide) through repeated spraying or careful pouring from the outer side of the diffusely active or auxiliary sorption outer layer of BB (the white layer of the covering unwoven textile) to compensate the evaporation or other losses by water supply. If the treatment principles (in this cases, particularly positioning the patient) are observed and, consequently, there is no risk of necrosis spreading under further pressure of the tissues, it is unnecessary and, in many cases, not desirable to uncover the surface of the defect when supplying water since this disturbs the healing process. The aforementioned procedure does not create the threat of introducing other infectious agents into the wound. The co-operation between the sorption and diffusely active layers forms an efficient barrier against microbes entering the bottom of the defect from outside. The diffusely active layer ensures concentration gradient with the “pump” effect from the surface of the defect; moreover, the sorption layer would retain the majority of infectious agents. The agents that might possibly reach the surface of the wound will not, if the sorption cover is applied correctly, find enough nutrients necessary for reproducing.

Cover exchange indication

An imperative impetus to exchange the BB cover is (while observing the previous principle strictly) the depletion of the active carbon layer sorption capacity. This occurs in dependence on the quantity of the agents absorbed, their character, exudation dynamism and exudates character. The depletion of the sorption capacity is indicated by the colouring of the top, diffusely active, layer of the unwoven textile. If any substances from the wound are entering the layer through the carbon layer and discolouring it (blood, albumin, pus etc.) it is necessary to exchange the cover immediately since it is not functional in this condition. With respect to the fact that the most frequent discolouration is yellow (exudates, tissue fluid) it is not recommended to use colourful solutions for moistening the BB cover (e.g. the yellow Ringer solution) in such cases (exchange of cover based on visual assessment) since their application makes correct assessment of the sorption capacity stage difficult. The possibility of checking the state of the active cover of the defect based on BB is valid when

the defect is under intensive, continuous control of the nurse and exchange of cover can be reliably and timely indicated through finding out the penetration of unwanted substances above the carbon layer.

In all other cases the BB is applied within the recommended scheme of wound treatment and exchange of sorption cover is regulated by the time schedule as stipulated in the scheme, in the manufacturer's detailed manual for covers with differentiated thicknesses of sorption layers made of unwoven textile. In such cases colourful solutions may be used. The scheme calculates a sufficient time reserve before using up the sorption capacity. The defect must be paid more attention in the introductory stage of therapy when the demands for cover exchange as well as water supply are higher. Each defect must be viewed individually and looked after intensely and carefully until the nurse is sure that the wound has been cleaned, local infections managed and the defect has been generally stabilised with transition to the healing stage – only then is it possible to adopt the routine of one of the recommended schemes.

Visual check of the effect

It is necessary to bear in mind that by applying BB we are not applying the classic "sterile" cover but that this is another (material) active element in the complex therapy. Due to the "activity", the introductory stage of treatment lasts significantly shorter compared to other materials used, that is, depending on the character and scope of the defect, from several tens of seconds or a few minutes (when stopping bleeding in fresh wounds) to several tens of minutes to a few hours (for trophic defects, infected wounds, in tissue detoxication). Therefore it is recommended to uncover, at least partially, the BB layer at the end of application and check visually how the defect responds to application of BB. It is not rare that even after a few minutes the eye can see an effect resulting in the reduction of the swelling, disappearance of surrounding erythema and other signs of inflammation (if they had been there before). This effect discovered through an early check is the first sign that the treatment has been applied correctly and the mechanism of sorption potentiated by osmosis has been started effectively.











Primary treatment

1. Perform careful mechanical cleaning of the defect including the removal of demarcated necrosis, drain exudates.
2. Treat the unaffected skin around the bedsore preventively against maceration by applying a thin layer of a suitable indifferent ointment.
3. By soaking the BB in a bowl of a suitable sterile solution, saturate the BB fully with the solution - carefully wring small air bubbles out of all BB layers under the surface of the solution. If the defect is a deeper one adapt the BB carefully by cutting the edges off to allow putting it in the defect without creating areas with no contact or even spaces filled with air (in the case of deeper defects, the treatment assumes the character of a "tamponade").
4. Carefully press the BB against the bottom of the bedsore, trying not to cause pain to the patient. Make sure again that no air was left between the sorption layer and the surface of the defect that would prevent the active cover from its proper function.
5. With a syringe, supply solution to the outer diffusely active or auxiliary water-retaining layer of BB since some of the solution could have been extracted by the previous manipulation.
6. Make sure that the patient is not complaining about increased pain resulting from the contact of the defect with the BB carbon layer. After several minutes, take off a corner of the BB with tweezers and check the condition of the defect. Check whether there has been any air retention under the sorption layer and try to assess the response of the bottom of the decubitus and its immediate surroundings (colour, oedema). After removing the possible faults from the perspective of presence of air, adhesion etc. and

finding out that the tissue does not respond in an undesired manner cover the entire defect again and proceed to the final step in the treatment.

7. Fix the BB while using light covering with a dry, permeable sterile material (where a cover layer of unwoven textile is not part of BB, add sterile gauze compresses etc.) and ensure light fixation (plaster, gauze bandage).

Re-bandaging

-   By taking off a corner of the BB in a careful manner, make sure that the active carbon layer has not adhered (stuck) to the surface of the bedsore. That alone is always an alarming sign of insufficient continuous solution supply and breach of the rule of treating the bedsore in a watery environment.
-   If such a complication is not discovered, proceed identically to the initial treatment in all steps. Pay special attention to manipulation with the BB, both with the cover with the depleted sorption capacity when taking it off and with the freshly applied cover. Take care not to disturb the newly formed granulations or the delicate layer of epithelium by insensitive manipulation.
-   If a complication in the sense of increased adhesion (sticking) of the BB to the bottom of the decubitus, discontinue the attempts at taking the sorption cover off immediately and repeatedly supply a suitable sterile solution to the surface of the cover. Wait for several tens of minutes until the BB is released from the bottom. Only afterwards take it off, very carefully. Then proceed identically to the initial treatment.
-   If local signs of microbial inflammation remain in the decubital defect even after three days from the initial application of BB, consider the application of a generally taken antibiotic or a modification of the ATB therapy so far in accordance with the result of microbiological examination for cultivation and sensitivity.
-   Carry out re-bandaging according to the character and development of the decubitus, initially after approx. 6 hours while gradually extending the intervals to the frequency of once in three days or longer.

With respect to the scope of the indication spectrum of the aforementioned material, extraordinary demands are put on the nurse with regards individual assessment of the wound (tissue defect) development while applying the active sorption cover and, therefore, the instruction text cannot fully replace the therapist's own erudition.

SURGICAL WOUND DEHISCENCE

Dehiscencia vulneris postoperativam

RECOMMENDED FRAMEWORK FOR TREATMENT PROCEDURE

with the use of Bauer Bandage medical device (hereinafter BB)

The text is an introduction into the issue of treatment of the aforementioned type of tissue defect. The text contains basic information and recommendations for application of sorption cover based on activated micro-filament carbon the effect of which is potentiated by the presence of diffusion activity additional composite layer in the form of unwoven textile made of a pre-defined fibre mix.

The BB sorption covering based on activated carbon is suitable for treatment of disrupted surgical wounds in their healing p.s. or in their preparation for re-suturing.

Treatment with active cover with direct contact between the carbon layer and the tissue defect surface differs in several regards from the generally accepted wound treatment principles under the conditions of classic asepsis. Therefore we believe it is necessary to point out the main differences.

Condition of permanent maintenance of aqueous solution environment (the so-called “watery wound healing”)

To enable the utilisation of the BB sorption capability in the treatment of dehiscence to the full degree and long-term it is necessary to ensure and, for the entire duration of treatment, maintain the sorption cover mass in the aqueous solution liquid phase environment. If using the nursing practice set terminology, this is an application rather than a bandage. In practice, this means continuous supply of sterile distilled water or other suitable sterile, ideally colourless, aqueous solution (physiologic solution, hydrogen peroxide) through repeated spraying or careful pouring from the outer side of the diffusely active or auxiliary sorption outer layer of BB (the white layer of the covering unwoven textile) to compensate the evaporation or other losses by water supply. At the same time, it is unnecessary and, in many cases, not desirable to uncover the surface of the defect when supplying water since this disturbs the healing process. The aforementioned procedure does not create the threat of introducing other infectious agents into the wound. The co-operation between the sorption and diffusely active layers forms an efficient barrier against microbes entering the bottom of the defect from outside. The diffusely active layer ensures concentration gradient with the “pump” effect from the surface of the defect; moreover, the sorption layer would retain the majority of infectious agents. The agents that might possibly reach the surface of the wound will not, if the sorption cover is applied correctly, find enough nutrients necessary for reproducing.

Cover exchange indication








An imperative impetus to exchange the BB cover is (while observing the previous principle strictly) the depletion of the active carbon layer sorption capacity. This occurs in dependence on the quantity of the agents absorbed, their character, exudation dynamism and exudates character. The depletion of the sorption capacity is indicated by the colouring of the top, diffusely active, layer of the unwoven textile. If any substances from the wound are entering the layer through the carbon layer and discolouring it (blood, albumin, pus etc.) it is necessary to exchange the cover immediately since it is not functional in this condition. With respect to the fact that the most frequent discolouration is yellow (exudates, tissue fluid) it is not recommended to use colourful solutions for moistening the BB cover (e.g. the yellow Ringer solution) in such cases (exchange of cover based on visual assessment) since their application makes correct assessment of the sorption capacity stage difficult. The possibility of checking the state of the active cover of the defect based on BB is valid when the defect is under intensive, continuous control of the nurse and exchange of cover can be reliably and timely indicated through finding out the penetration of unwanted substances above the carbon layer.

In all other cases the BB is applied within the recommended scheme of wound treatment and exchange of sorption cover is regulated by the time schedule as stipulated in the scheme, in the manufacturer's detailed manual for covers with differentiated thicknesses of sorption layers made of unwoven textile. In such cases colourful solutions may be used. The scheme calculates a sufficient time reserve before using up the sorption capacity. The wound must be paid more attention in the introductory stage of therapy when the demands for cover exchange as well as water supply are higher. Each wound must be viewed individually and looked after intensely and carefully until the nurse is sure that the wound has been cleaned, local infections managed and the wound has been generally stabilised with transition to the healing stage – only then is it possible to adopt the routine of one of the recommended schemes.

Visual check of the effect

It is necessary to bear in mind that by applying BB we are not applying the classic "sterile" cover but that this is another (material) active element in the complex therapy. Due to the "activity", the introductory stage of treatment lasts significantly shorter compared to other materials used, that is, depending on the character and scope of the defect, from several tens of seconds or a few minutes (when stopping bleeding in fresh wounds) to several tens of minutes to a few hours (for trophic defects, infected wounds, in tissue detoxication). Therefore it is recommended to uncover, at least partially, the BB layer at the end of application and check visually how the defect responds to application of BB. It is not rare that even after a few minutes the eye can see an effect resulting in the reduction of the swelling, disappearance of surrounding erythema and other signs of inflammation (if they had been there before). This effect discovered through an early check is the first sign that the treatment has been applied correctly and the mechanism of sorption potentiated by osmosis has been started effectively.

Primary treatment

-  Perform careful mechanical cleaning of the wound with removal of loose stitches.
-  Treat the unaffected skin around the wound preventively against maceration by applying a thin layer of a suitable indifferent ointment.
-  By soaking the BB in a bowl of a suitable sterile solution, saturate the BB fully with the solution - carefully wring small air bubbles out of all BB layers under the surface of the solution. Adapt the BB carefully by cutting of the edges so it is possible to put it in the wound without creating areas with no contact or even spaces filled with air, for deeper wounds fill the cavity resulting from the insertion of BB in the wound with damp mull, therefore the treatment is of the "tamponade" type.
-  Press the BB carefully into the wound in the entire area, however, trying not to cause pain to the patient. Make sure again that no air was left between the sorption layer and the surface of the defect that would prevent the active cover from its proper function.
-  With a syringe, supply solution to the outer diffusely active or auxiliary water-retaining layer of BB since some of the solution could have been extracted by the previous manipulation.
-  Make sure that the patient is not complaining about increased pain resulting from the contact of the defect with the BB carbon layer. After several minutes, take off a corner of the BB with tweezers and check the condition of the wound. Check whether there has been any air retention under the sorption layer and try to assess the response. After removing the possible faults from the perspective of presence of air, adhesion etc. and finding out that the tissue does not respond in an undesired manner cover the entire wound again and proceed to the final step in the treatment.
-  Fix the BB while using light covering with a dry, permeable sterile material (where a cover layer of unwoven textile is not part of BB, add sterile gauze compresses etc.) and ensure light fixation (plaster, gauze bandage).

Re-bandaging

1. By taking off a corner of the BB in a careful manner, make sure that the active carbon layer has not adhered (stuck) to the surface of the wound. That alone is always an alarming sign of insufficient continuous solution supply and breach of the rule of treating the wound in a watery environment.
2. If such a complication is not discovered, proceed identically to the initial treatment in all steps. Pay special attention to manipulation with the BB, both with the cover with the depleted sorption capacity when taking it off and with the freshly applied cover.
3. If a complication in the sense of increased adhesion (sticking) of the BB to the bottom of the defect, discontinue the attempts at taking the sorption cover off immediately and repeatedly supply a suitable sterile solution to the surface of the cover. Wait for several tens of minutes until the BB is released from the bottom. Only afterwards take it off, very carefully. Then proceed identically to the initial treatment.
4. If local signs of microbial inflammation remain in the defect even after three days from the initial application of BB, consider the application of a generally taken antibiotic or a modification of the ATB therapy so far in accordance with the result of microbiological examination for cultivation and sensitivity.
5. Carry out re-bandaging according to the development of healing initially every approx. 24 hours while gradually extending the intervals.

If the wound is generally stabilised, the exudation disappears and inflammation is completely suppressed, the treating physician must assess the effectiveness of the possible re-suturing. After that has been performed, use BB applied as dry cover to cover the post-surgery wound (see preventive use of the BB in surgery).

With respect to the scope of the indication spectrum of the aforementioned material, extraordinary demands are put on the nurse with regards individual assessment of the wound (tissue defect) development while applying the active sorption cover and, therefore, the instruction text cannot fully replace the therapist's own erudition.

INSECT STING

applies to stinging by bees, wasps, bumble bees or hornets

RECOMMENDED FRAMEWORK FOR TREATMENT PROCEDURE

with the use of Bauer Disc medical device (hereinafter BD)

The text contains basic information and recommendations for application of sorption cover based on activated micro-filament carbon the effect of which is potentiated by the presence of additional composite layer in the form of unwoven textile made of a pre-defined fibre mix.

The BD sorption covering based on activated carbon is suitable for treatment of a wide spectrum of stings or bites by poisonous insects from more or less banal small affections to life-threatening conditions of multiple exposure (e.g. attack of a cluster of bees) or as part of the complex sting therapy in allergic persons with increased sensitivity to the relevant insect species' toxins.

Treatment with sorption cover with a direct contact of the carbon layer with the surface of the skin cover and, primarily, the course of the reaction differ in certain respects from generally accepted principles for treatment of insect stings. Therefore we believe it is necessary to point out the main differences as well as give a brief explanation of the basic physical and chemical principles of the effects.

In the case of a poisonous insect sting the detoxication capabilities of activated carbon potentiated by diffusion gradient are involved. They can be utilised to the full extent only if the skin surface and the entire cover fully saturated with water. Only in such a situation the effect of diffusion pump can be utilised which enables the "draining" of the toxin and mediators released by it from the affected tissue, adsorption into the structure of the activated carbon and, at least partial, prevention of the painful and unpleasant inflammatory reaction.

General

Most people do not suffer a major damage because of a bee sting. Although a slight swelling in the location of the sting that lasts 2 to 3 days occurs if the sting is not treated fast and effectively, however, that is a common reaction of a healthy organism to for instance bee's poison.

Warning

Serious danger is associated with cases of multiple exposure or when a person is stung by a higher number of bees or similar insects or if a person is stung at the stem of the tongue (suffocation danger), in the eye or an artery or vein. In the event of a sting located in one of the aforementioned locations, do not rely on the application of BD solely and seek professional medical help immediately. This applies to the full extent also to cases when the affected person is allergic since there is also a certain percentage of people in the population who are hypersensitive to bee stings and even a common sting might result in serious complications or even death in such cases unless treated in time and in a complex manner.

Prevention

If you want to minimise the encounters with bees do not stand in front of a beehive to be in the bees' way, do not work near a beehive if you are sweating, have applied a perfume or drunken beer. Bees consider all distinctive smells a fight pheromone that is exuded by the bee sting into the surroundings of the sting, and immediately attack its source. Do not wave your arms when a bee is flying by because rapid movements irritate bees and multiply their stinging activity. Do not work near a beehive wearing a sweater and long loose hair – a bee might become stuck in the sweater with its legs and start stinging. Do not drink any alcohol and do not speak unnecessarily – this is prevention against receiving a sting in the stem of the tongue. Also, be sure to check fruit eaten straight from the tree or bush. Bees' stinging activity is highest before a storm, when the poppies are in flower, prior to swarming (May, June) or on hot days following long rain periods (days without honey deposits). Mowing the lawn and loud noise irritates bees, too; therefore mow in the morning or

in cool weather. If you are stung by a bee it is more painful in the spring since the strength and effectiveness of the poison is determined by the quantity of pollen that the bee has been processing in the relevant period.

Treatment procedure for stings

1. Remove the sting from the wound immediately, ideally with beekeepers' tweezers or by pulling a hard plate (credit card, blunt side of a knife, in case of emergency a nail etc.) over the skin at the spot of the sting. Warning, do not pull the sting out while holding the end with the poison capsule! Pressing the capsule would release even more poison in the wound.
2. As soon as possible, wipe the spot with cold water and prepare for application of BD, or another form of the type of active sorption bandage.
3. BD designated to treat stings of poisonous insects has an active, two-ply thick auxiliary layer of absorbing unwoven textile. Therefore, soak it in cold water so that it is saturated with water (water should run out) and put on the affected spot with the sorption carbon layer on the bottom side so that it adheres with the entire area of the disc to the spot and its surroundings where the signs of effects of the poison are becoming evident (reddening or paling out of the affected part of the skin, swelling). Use such a dimension of the disc that it exceeds the affected area where the signs of effects of the poison are becoming evident at the moment at least by 1 to 2 cm on each side.
4. Continue cooling the area with the disc applied by pouring cold water directly on the top auxiliary layer of unwoven textile or by complete immersion of the affected spot.
5. In case of obvious decrease of pain (usually within 30 seconds to 2 minutes of application of the disc) take the disc away and perform a brief visual check of the reaction to the bee sting; simultaneously soak the disc again in cold water and apply again for several minutes. Check the development every now and then and when all symptoms have disappeared, usually within 15 minutes of application, take the disc off.

In the event of a wasp sting, or sting by other insects that do not leave the sting in the spot, proceed similarly with the exception of the first item in the aforementioned procedure.

BLEEDING WOUNDS

Vulnera cruenta

RECOMMENDED FRAMEWORK FOR TREATMENT PROCEDURE

with the use of Bauer Bandage medical device

The text contains basic information and recommendations for application of sorption cover based on activated micro-filament carbon the effect of which is potentiated by the presence of additional composite layer in the form of unwoven textile made of a pre-defined fibre mix.

Indication spectrum

The Bauer Bandage sorption covering based on activated carbon is suitable for initial treatment of a wide spectrum of bleeding wounds from generally banal small affections (small cuts and abrasions) to life-threatening conditions. The haemostyptic effect of the sorption bandage made of chemically pure activated micro-filament carbon is utilised particularly on fresh wounds bleeding from capillaries and small veins, on large wounds of skin cover. At the time of latest update of this text, clinical studies were in preparation aiming to confirm the effect in stopping bleeding from surgically disrupted synchondroses, in surgery on parenchymatic organs (for instance partial resection), after dental extractions and as effective first aid in serious war gunshots and punctured wounds.

General

The application of pressure in the location of the wound reduces the space between the fibres of the activated carbon within the layers of active sorption cover which increases the capillary forces affecting the blood plasma. This results in accelerated blood absorption in the sorption carbon layer. Since water has easiest access into the structure of the carbon mesh due to the small size of the molecule, the remaining space between the surface of the wound and the sorption layer, or between its sheets, records significant haem-concentration. At the same time, there is massive contact of the factor that starts the haem-coagulation cascade with the waterytable surface of the carbon fibres. Based on the utilisation of both these mechanisms the haem-coagulation process is started and with respect to the aforementioned facts, it is significantly accelerated in comparison with usual parameters.

Warning! Important notice:

!!! CONTRASTINGLY TO OTHER INDICATIONS FOR THE BAUER BANDAGE, SORPTION COVER TO STOP BLEEDING IS ALWAYS TO BE APPLIED DRY IN COMBINATION WITH A COMPRESS !!!

Basic procedure in bleeding wound treatment

1. Observe all usual principles of surgical treatment while using the BAUER BANDAGE.
2. Medical appliances based on the active sorption two-ply layer that bears the registered trademark of Bauer Bandage are intended for single use and are sterile prior to opening the primary packaging. Therefore, where it is technically viable and effective, comply with principles of treatment in sterile conditions.
3. Apply local anaesthetic to the patient, according to the character of the wound, analgetics, general antibiotics or other therapy, for instance anti-shock, adequately to the condition of the patient and the wound.
4. Remove foreign objects from the wound and macroscopically obvious impurities.
5. Carry out a careful cleaning of the wound utilising delicate soap or weak disinfectant solution.

6. Where effective, perform careful adaptation of edges of the wound to make them as close to the physiological condition as possible.
7. As soon as the wound has been treated, immediately apply active sorption cover in the dry form with the black layer straight on the surface of the wound so that the BAUER BANDAGE is in direct contact with the entire area of the wound.
8. In small wounds, apply small compression for 30 to 120 seconds. Afterwards, remove the Bauer Bandage carefully from the wound and make a visual check to see whether the bleeding has been stopped completely. If the bleeding continues apply the Bauer Bandage again and continue compressing. If necessary, repeat the procedure until the bleeding has stopped. For excoriations, leave the wound free for a certain period of time (a few minutes) after stopping the bleeding to achieve drying up of the blood coagulum; then you can apply Bauer Bandage plaster forms as a coating of the wound with preventive bacteriostatic effects.
9. In larger wounds apply compression and ensure specialist surgical treatment for the patient.
10. Apply tetanic anatoxin to all patients who have not had appropriate vaccination.