CERDAK™

Ceramic wound dressing

Non-medicated dressing for
healing of chronic and acute wounds



Redefining wound care

The Essence of Wound Healing

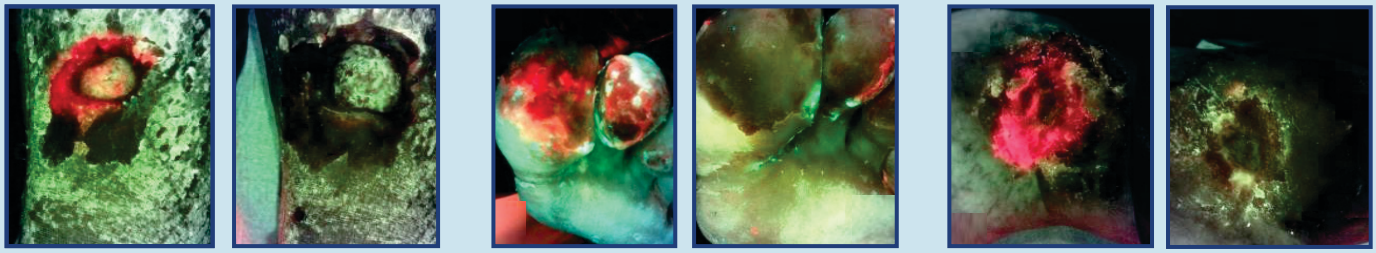
01 **Delayed healing is caused by a prolonged inflammation phase.**

02 **Prolonged inflammation is caused by bacteria, toxins, contaminants, and devitalized tissue.**

03 **Mechanical removal and sequestration of the bacteria, toxins, contaminants and devitalized tissue reduces inflammation and triggers the cell proliferation phase.**

04 **An optimal proliferation phase is the goal in wound healing.**

Fluorescence imaging by MolecuLight shows a rapid reduction in the bacterial load after using Cerdak dressings.



Day 1 Day 7 Day 1 Day 5 Day 1 Day 5

Red in the picture above indicates a bacteria load of more than 10^4 CFU per gram.

Innovative Ceramic Technology for Advanced Wound Care

Cerdak dressings consist of ceramic spheres with a micro-porous structure and a charged surface. The spheres are housed in non-woven sachets and the sachets are applied directly onto the wound.



Disruptive Innovation Redefining Wound Care


Day 0


Day 0


Day 3

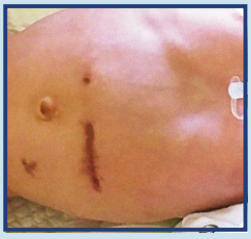

Day 13


Day 19

30 year old man with a wound infection. The wound was treated with Cerdak dressings by a pharmacy clinician at the patient's home.


Day 0


Day 5


Day 41

Dehiscence wound infected with MRSA in a 10 week old child. Treated with Cerdak Basic.

- **Antimicrobial action** *versus* antimicrobial agents.
- **Start Cerdak treatment regardless of the stage on the wound continuum** *versus* differentiate between clean, contaminated, colonized and infected wounds.
- **Uncomplicated, regular replacement of dressing by the patient or caregiver** *versus* periodic dressing change procedure by clinician.
- **Efficient removal of exudate and bacteria by the dressing** *versus* the need for wound cleansers and disinfectants.


Day 1


Day 4


Day 41

38 year old man with a toxic wound (spider bite). Cerdak used to remove toxins from the wound bed.


Day 0

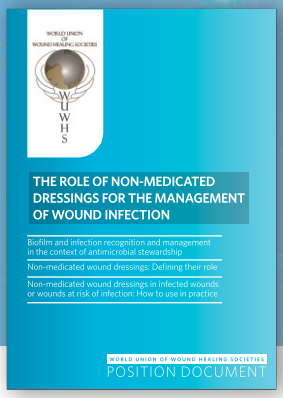

Day 36


Day 36

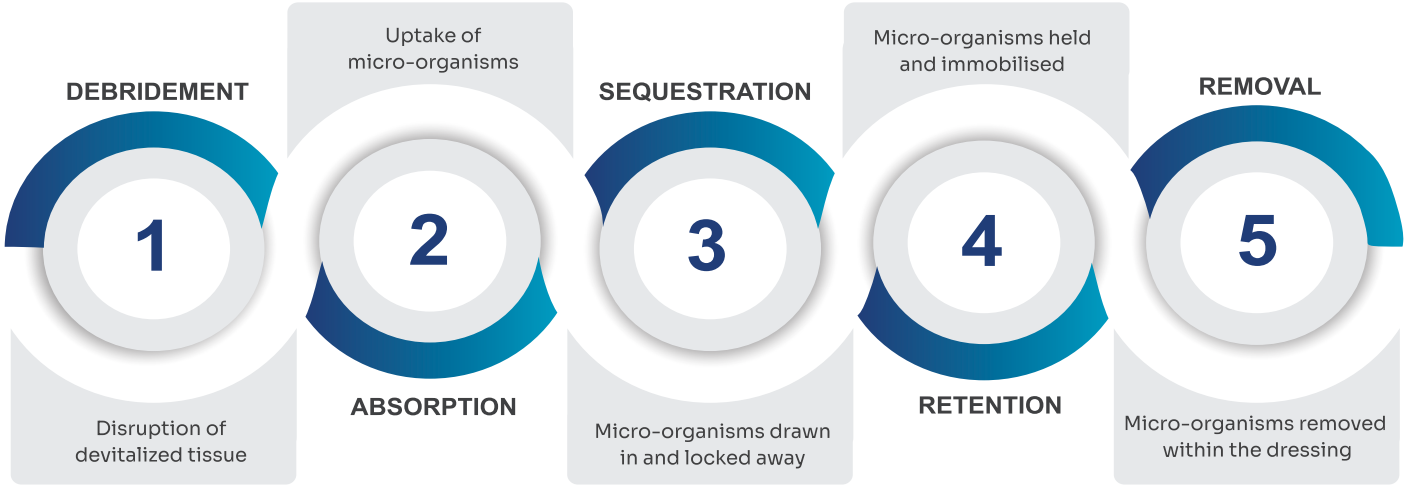

Day 60


Day 80

50 year old lady underwent abdominoplasty 32 days prior to Day 0 when treatment with Cerdak dressings started.



According to a 2020 Position Document of the World Union of Wound Healing Societies on the use of non-medicated dressings for the treatment of infected wounds, the mechanism of action is fundamental to the success of such a dressing.



(WUWHS 2020)

Definition of Non-Medicated Wound Dressing (NMWD)

NMWD's, as suggested the name, do not contain any active antimicrobial agents. For NMWD to diminish the impact of bacteria (e.g. infection) they must reduce wound bio burden via mechanism(s), other than killing – for example, by physical means only. (WUWHS 2020)

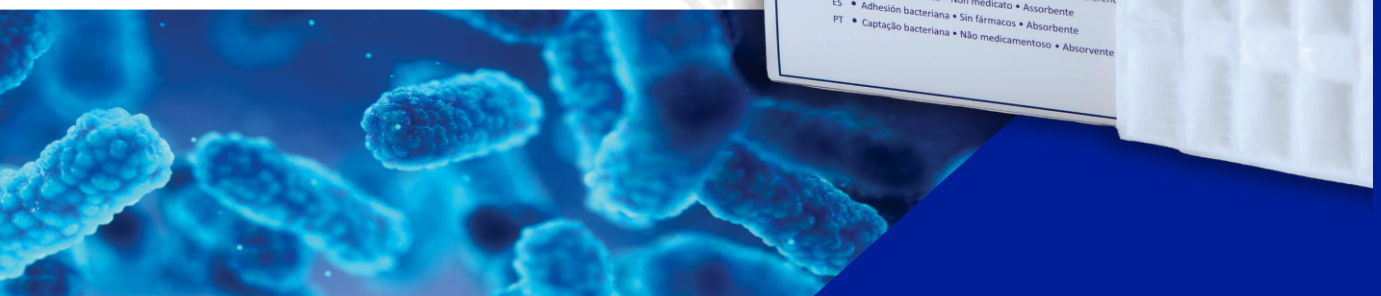
Cerdak is a non-medicated dressing, inert and free from any antimicrobial agents or chemicals that can be transferred to the wound.

Cerdak a Non-Medicated Wound Dressing for the Management of Wound Infection

Cerdak ceramic wound dressings comply with the requirements suggested by the Position Document, and also add the important properties of bacterial binding and improved oxygen supply.

The Benefit of Cerdak as a Non-Medicated Dressing

1	DEBRIDEMENT	Sequestration of devitalized tissue that are mobilized by the exudate to support various debridement techniques available to clinicians.
2	ABSORPTION	Patented micro-structure of the ceramic triggers an average capillary force of 350kPa to remove exudate that makes contact with the ceramic.
3	BINDING	The high surface area of the ceramic is highly charged and binds with bacteria and other micro-organisms.
4	SEQUESTRATION	Strong capillary suction is created when liquid exudate comes into contact with the fine pores of the ceramic.
5	RETENTION	Micro-organisms suspended in the exudate that are too large to be absorbed with the liquid, are trapped and adsorbed on the surface of the ceramic.
6	REMOVAL	Regular removal of the Cerdak sachets ensures that the micro-organisms are removed from the wound environment.
7	GOOD OXYGEN SUPPLY	Improves the supply of atmospheric oxygen due to the removal of exudate and permeability of air through loosely packed spheres.





The Mechanism

Cerdak technology employs micro-porous alumina ceramic spheres, serving a dual role in wound care. Cerdak dressings manage exudate, contaminants, micro-organisms and devitalized tissue while maintaining an oxygen-rich environment, promoting effective wound healing in a balanced approach.

Absorption

The ceramic spheres contained in the sachets have a patented micro-structure. The spheres have an average diameter of 1mm and are characterized by an interconnected porosity of 65% by volume. The mechanism for absorbing and storing wound exudate in these spheres relies on capillary pressure created within the pores of each sphere. This capillary action facilitates the effective absorption and retention of exudate from the wound bed, contributing to a controlled and efficient wound healing process.

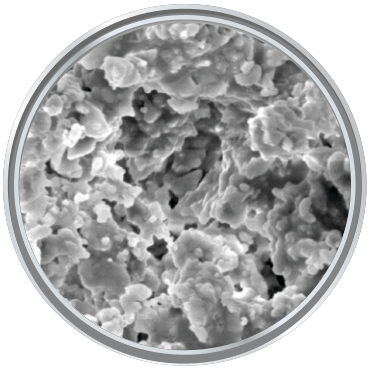


Ceramic Spheres

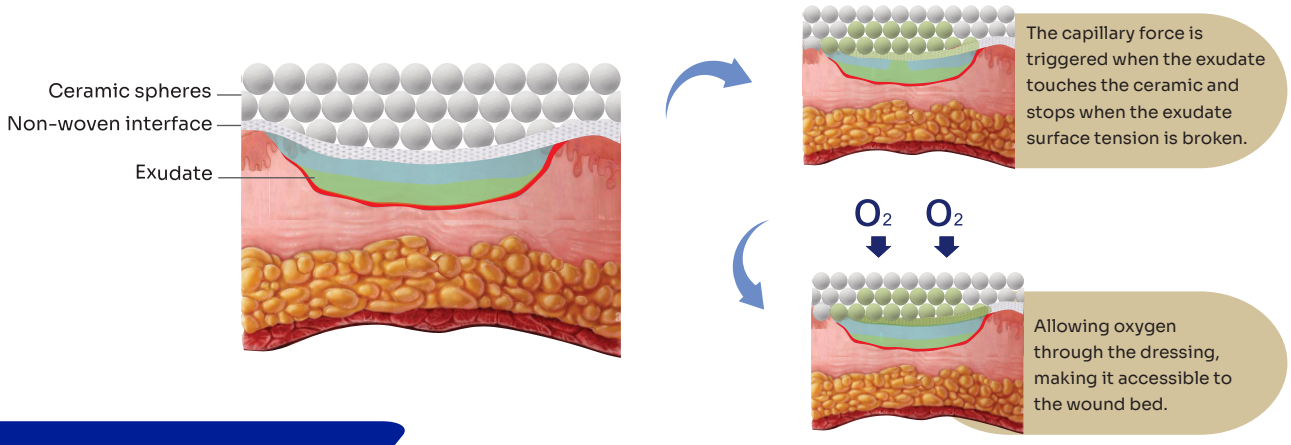
Binding

The adhesion properties between charged colloids suspended in the absorbed exudate and the charged alumina surfaces lead to the adsorption of bacteria and other harmful substances onto the ceramic's surface. This phenomenon has been extensively researched due to its significance in biomedical prosthetic systems. For instance, it is well documented that suspended proteins are charged colloids adhere to wet alumina surfaces.

This adsorption is driven by various interactions, including ionic and electrostatic forces, hydrogen bonding, and charge-transfer interactions. Understanding these adhesive mechanisms is critical in the development of effective biomedical prosthetic systems and wound management strategies.



Porous Structure



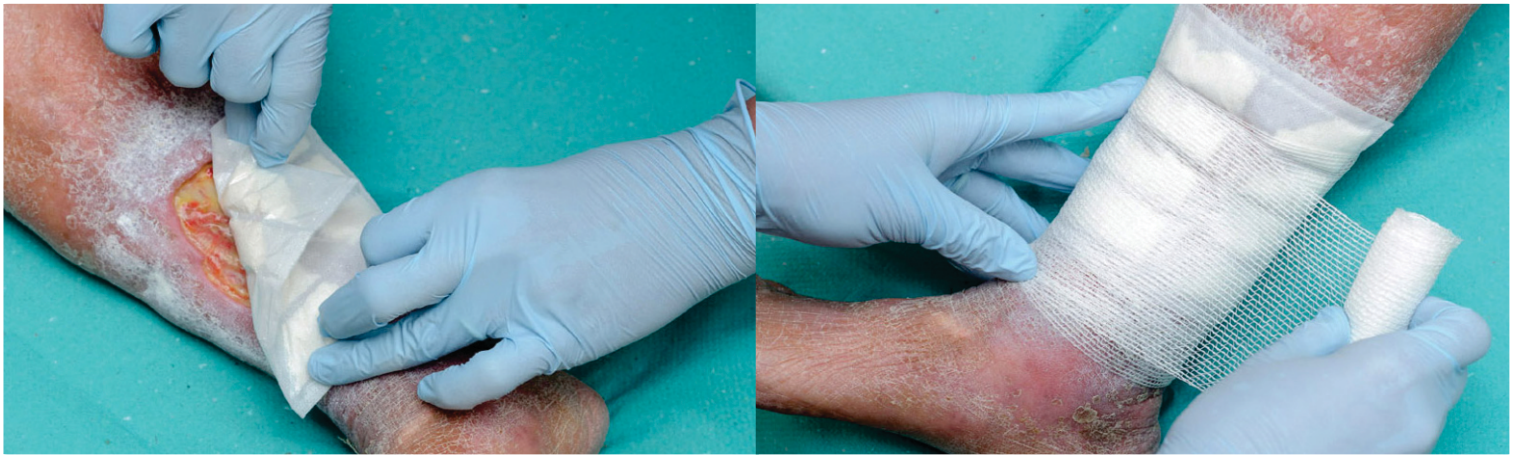
Oxygen

Exudate is absorbed into the open pores of the ceramic without any changes in the shape allowing atmospheric oxygen between the spheres. Wounds consume much more oxygen than healthy tissue to maintain metabolic processes and therefore a good supply of oxygen is key in every stage of wound healing.

Application

Cerdak is suitable for both chronic and acute wounds, as the fundamental phases and metabolic processes remain constant regardless of the wound's origin. Cerdak dressings aim to enhance the natural healing process.

Application of Cerdak Basic:



01

Select a suitable size of Cerdak dressing to cover the entire wound bed. More than one Cerdak basic can be used for larger wound areas if required.

02

Apply the shiny side of the dressing to the wound. This will prevent sticking of the dressing on certain types of wounds.

03

For the first five days of the treatment, change the dressing daily. After 5 days, change the dressing when it becomes 70% discoloured (almost fully saturated). The time it takes for the dressing to discolour will depend on the rate at which the wound produces exudate. Do not use ointments or topical treatments; keep the dressing dry.

Range

Cerdak Basic wound pads consist of ceramic spheres in non-woven sachets. Various shapes and sizes are available to treat the various wound shapes and types.

Cerdak offers a range of dressing options, including wound pads pre-mounted on fabric and film adhesives. These versatile designs cater for diverse applications, such as digital injuries, cavity wounds, catheters and tracheoscopy sites.





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