

Beauty in wound care – Advanced dressing

*Dr Sergio Mazzei – General Surgeon and Wound Care Specialist
Hyperbaric Oxygen therapy and wound care Department*

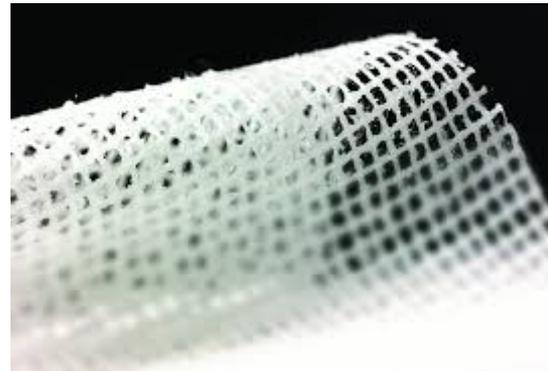
Raffles Hotel 17th January 2020





Advanced dressing

- *Many classifications*
- *Many dressings have been introduced during the past decade*
- *It can help to take care of patients with no wound healing*





Advanced dressing

History

- Dry wound
- 1962 Winter and Coll.
- Optimal moist microenvironment

Advanced dressing

- Barrier against contamination and trauma
- Reduce contamination
- Removing the necrotic tissue and slough
- Delaying the change dressing
- Quality of life for the patient
- Healing



Dressing

- Tradition dressing
- Advanced dressing



Traditional dressing - Gauze

- Non-resorbable gauze/sponge dressings made of woven or non-woven cotton-mesh cellulose or cellulose derivatives
- Manufactured in the form of pads or strips
- Protect the wound from external contamination
- Secondary dressing
- Absorb secretions



Advanced dressing

- Hydrocolloid
- Hydrogel
- Enzymatic dressing
- Foam
- Alginate dressing
- Hydroalginate
- Hydrofiber
- Antiseptic dressing
- Wound irrigation



Hydrocolloid

- ✓ It contains hydrocolloidal hydrophilic particles (mainly sodium carboxy methyl cellulose)
- ✓ Gel-forming
- ✓ Mild-to-moderate exudating ulcers, burn wounds, and donor sites
- ✓ On infected or necrotic wounds is definitely contraindicated
- ✓ Up to 5–7 days before changing
- ✓ The frequency of changing dressings it depends on the appearance of the ulcer

Examples of hydrocolloid dressings:

- Comfeel® – Coloplast
- Cutinova® – Beiersdorf-Jobst
- Dermacol® – Derma Sciences
- Dermatell® – Gentell
- Duoderm® – Convatec
- Exuderm® – Medline Industries
- Granuflex® – Convatec
- Hydrocol® – Bertek Pharmaceuticals
- Hydrocoll® – Hartmann
- Nu-derm (hydrocolloid)® – Johnson & Johnson
- Oriderm® – Orion Medical Products
- Replicare® – Smith & Nephew
- Restore® – Hollister Incorporated
- Tegasorb® – 3M Health Care
- Ultec® – Kendall



Hydrogel

- ✓ Three-dimensional matrix of hydrophilic polymers, such as carboxy-methylcellulose or polyethylene oxide, combined with a high (usually more than 90%) water content.
- ✓ Hydrogel dressings may be applied to ulcers that present white or yellowish slough on their surface
- ✓ Autogenous enzymes released by dead or damaged tissue disintegrate

Examples of hydrocolloid dressings:

- Comfeel® – Coloplast
- Cutinova® – Beiersdorf-Jobst
- Dermacol® – Derma Sciences
- Dermatell® – Gentell
- Duoderm® – Convatec
- Exuderm® – Medline Industries
- Granuflex® – Convatec
- Hydrocol® – Bertek Pharmaceuticals
- Hydrocoll® – Hartmann
- Nu-derm (hydrocolloid)® – Johnson & Johnson
- Oriderm® – Orion Medical Products
- Replicare® – Smith & Nephew
- Restore® – Hollister Incorporated
- Tegasorb® – 3M Health Care
- Ultec® – Kendall



Enzymatic dressing

- ✓ Topical foam with proteolytic enzymes using foam of fruit juice (papaya and pineapple)
- ✓ On the 1960 the first scientific records was performed about the use of proteolytic enzymes in the treatment of chronic wounds.
- ✓ It is a specific wound debridement option using item in gel or ointment
- ✓ It can be used when mechanical debridement is a contraindication or are not available (home care service, patient's clinical condition and so on)
- ✓ Dry wounds are relative contraindication for the use
- ✓ Irritation of peri wound skin with discomfort and inflammation





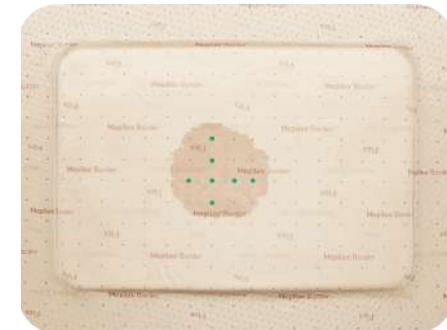
Enzymatic dressing

- ✓ Proteolytic enzymes are used to hydrolyse peptide bonds, to facilitate the removal of necrotic tissue
- ✓ Collagenases are the only endoproteases that can degrade the human triple helical collagen
- ✓ Bacterial collagenase breaks the triple helix structure of collagens promoting the wound healing
- ✓ **Clostridium Peptidase A from Clostridium Histolyticum**
- ✓ It is not possible to cover with antiseptic dressing or soap because some enzymes become ineffective in the presence of these solutions



Foam

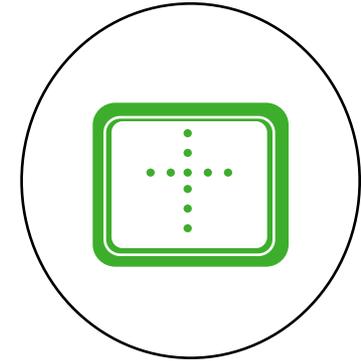
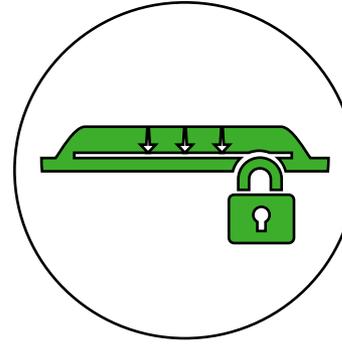
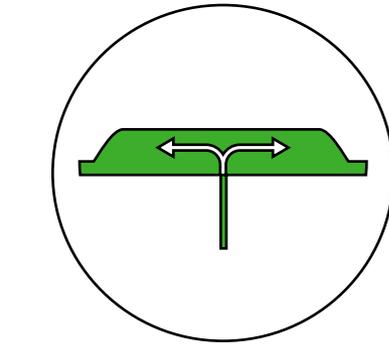
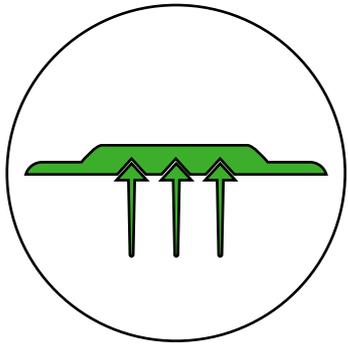
- ✓ Polymeric material such as polyurethane contain air bubbles
- ✓ The dressing material can absorb the fluids filling the air bubbles
- ✓ When air bubbles are filled by secretions, the foam cannot release it
- ✓ Occlusive or semi-occlusive
- ✓ Permeable to gases and water vapor
- ✓ The absorptive capacity is dependent on the thickness of the dressing
- ✓ Their use may be considered with secreting ulcers





Foam

Different steps



Rapid absorption

Exudate channelled

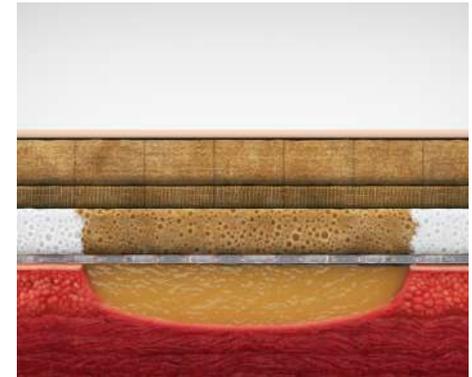
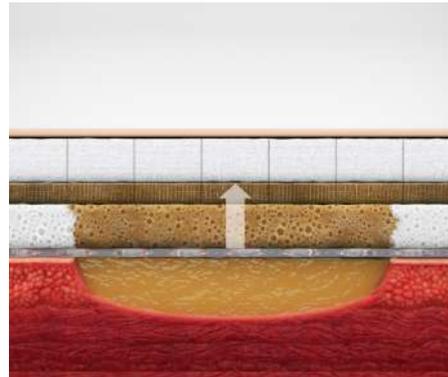
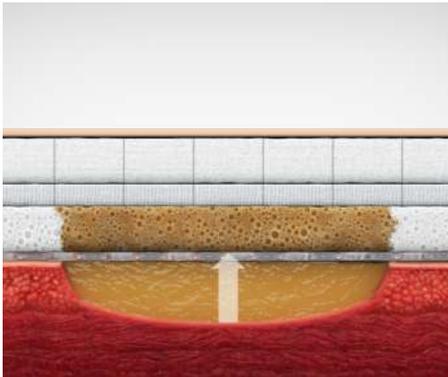
Bacteria trapped away from
the wound

Exudate tracked without
dressing removal

Foam

Key work - Exudate channelled

Lateral dispersion maximises the absorption of the fluid capacity



Lateral spread + breathable film = handling fluid capacity reducing maceration



Foam

Examples of foam dressings:

- Allevyn® – Smith & Nephew
- Biatain® – Coloplast
- Carrasmart foam® – Carrington Lab
- Curafoam plus® – Kendall
- Cutinova foam® – Beiersdorf-Jobst
- Flexzan® – Bertek Pharmaceuticals
- Hydrasorb® – Convatec
- Lyofoam® – Convatec
- Mepilex® – Mölnlycke Health Care
- 3M Foam® – 3M Health Care
- Orifoam® – Orion Medical Products
- Sof-foam® – Johnson & Johnson
- Reston foam® – 3M Health Care
- Tielle® – Johnson & Johnson
- Vigifoam® – Bard Med. Division





Alginate dressing

- ✓ Alginate dressings are made of polysaccharide fiber, containing alginic acids, derived from various species of seaweed
- ✓ The fibers absorb the ulcer exudate with the formation of a highly absorbent hydrophilic gel
- ✓ Alginate dressings are indicated for moderate-to-heavy exudating cutaneous ulcers
- ✓ It can contain Silver to control bacterial overgrowth





Alginate dressing

- ✓ Easy and pain-free removal
- ✓ Provides a sustained release of silver ions in vitro for up to 7 days
- ✓ Is effective against a broad spectrum of wound pathogens including MSRA, MRSE and VRE

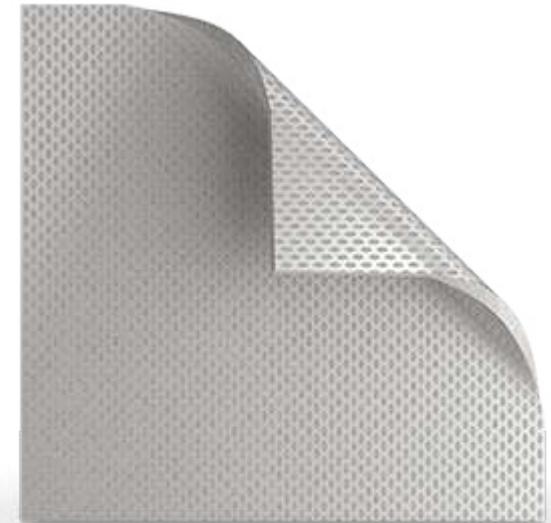
Examples of alginate dressings:

- Algiderm® – Bard Med. Division
- Algisite® – Smith & Nephew
- Carrasorb® – Carrington Lab
- Curasorb® – Kendall
- Cutinova alginate® – Beiersdorf-Jobst
- Fybron® – B. Braun Medical
- Hyperion® – Hyperion Medical
- Kalginat® – Deroyal
- Kaltostat® – Convatec
- Maxorb® – Medline Industries
- Melgisorb® – Molnlycke Health Care
- Nu-derm® – (alginate) – Johnson & Johnson
- Nutrastat® – Derma Sciences
- Orisorb® – Orion Medical Products
- Restore CalciCare® – Hollister
- Seasorb® – Coloplast
- Sorbalgon® – Hartmann
- Sorbsan® – Bertek Pharmaceuticals
- Tegagen alginate dressing® – 3M Health Care



Hydro-alginate dressing

- ✓ It is a pad made of alginate and Carboxymethylcellulose (CMC) and silver coated nylon fiber
- ✓ Antimicrobial action
- ✓ High absorbency
- ✓ Easy and pain-free removal
- ✓ Protection of the newly formed tissue
- ✓ MSRA, MRSE and VRE





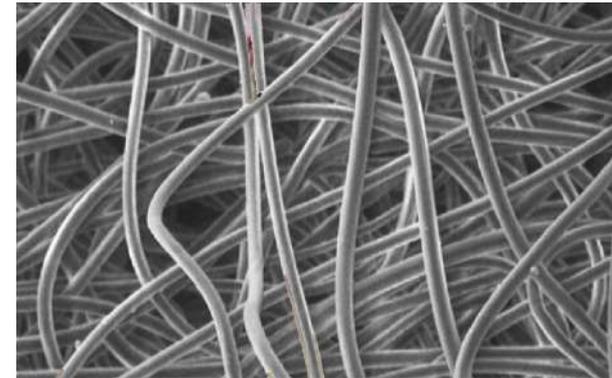
Hydro-alginate dressing





Hydrofiber

- ✓ A Hydrofiber is defined as a soft, sterile, non-woven pad or ribbon dressing composed of sodium carboxymethylcellulose
- ✓ Can absorb a large amount of wound fluid, such as exudate with bacteria
- ✓ The gel also aids the removal of non-viable tissue from the wound (autolytic debridement), without damaging newly formed tissue
- ✓ A moist wound environment to support healing with Excellent absorption and retention
- ✓ Protection for peri-wound skin
- ✓ Reduced maceration





Hydrofiber

- ✓ Reduced cross-contamination on dressing removal
- ✓ Balanced inflammatory response
- ✓ Absorb and contain wound fluid
- ✓ remove secretions from the wound bed and the peri-wound area
- ✓ Protecting from potential maceration
- ✓ contains fine silver sulphate crystals
- ✓ When exudate comes into contact with the dressing the crystals dissolve and release silver ions





Antiseptic dressing

Povidone-iodine (PVP-I)

- ✓ Broad spectrum antimicrobial action
- ✓ It has been proven to be effective against MRSA
- ✓ Minimizes adherence to the wound bed, therefore reducing the risk of damage to the granulation tissue at dressing removal
- ✓ Reduce pain for patients



Antiseptic dressing

Povidone-iodine (PVP-I)

- ✓ Dressing will change colour from orange to white.
- ✓ Indicator of how frequently dressings should be changed
- ✓ Improve cost effectiveness in treatment



Antiseptic dressing

Cadexomer iodine

- ✓ Cadexomer iodine consists of small polysaccharide beads (cadexomer starch) containing 0.9% iodine with highly absorptive properties
- ✓ Wound exudate swell the polysaccharide beads , allowing a slow sustained release of iodine into the wound



Antiseptic dressing

PHMB - polyhexamethylene biguanide

- ✓ PHMB is a synthetic polymer structurally similar to naturally occurring antimicrobial peptides (AMPs).
- ✓ Antimicrobial peptides (AMPs), also called host defense peptides (HDPs) are part of the innate immune response
- ✓ Gram negative and Gram positive bacteria, enveloped viruses, fungi and even transformed or cancerous cells
- ✓ It can enter bacterial cell membranes and kill bacteria in a similar way to AMPs



Antiseptic dressing

PHMB - polyhexamethylene biguanide

- ✓ PHMB is thought to adhere to and disrupt target cell membranes, causing them to leak potassium ions and other cytosolic components
- ✓ Binds to DNA and other nucleic acids damaging or inactivating bacterial DNA
- ✓ Good clinical safety
- ✓ No known risks of reabsorption
- ✓ Toxicity risks
- ✓ Low risk of contact sensitisation



Wound irrigation

Saline
solution

Sterile
water

Potable water/ Water
and soap

Hydrogen
peroxide

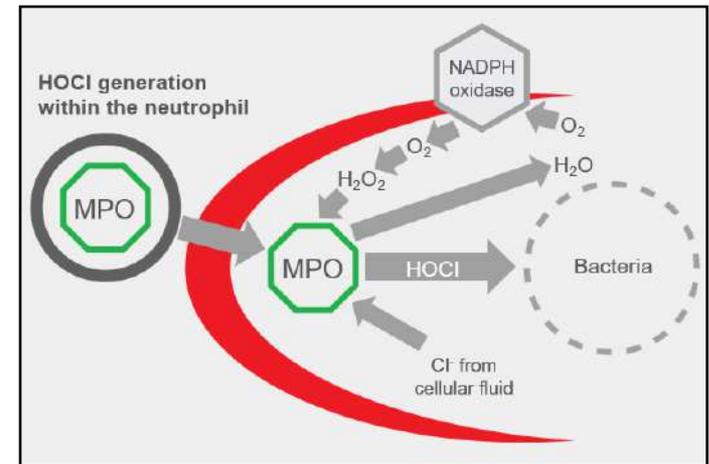
Povidone
iodine

Sodium
hypochlorite

Wound irrigation

Hypochlorous acid

- ✓ Hypochlorous acid was introduced in World War I to treat wound infection
- ✓ In Humans, HOCl is used to attack bacteria in the oxidative burst process:
 - Oxygen is converted to hydrogen peroxide by an enzyme
 - Another enzyme converts hydrogen peroxide and chlorine ions to HOCl



Wound irrigation

Hypochlorous acid

- ✓ It is a Hypotonic solution and can destroy the cell wall
- ✓ Hypotonicity leads to osmolysis
- ✓ LOW Irritation-Threshold
- ✓ Selective effect on cells
- ✓ Biocompatible
- ✓ No signs of cytotoxicity
- ✓ No signs of carcinogenicity
- ✓ No damage the tissues: cartilage, Mucosa and Peritoneum



Wound irrigation

super-oxidized solution

- ✓ Gram Positive, Gram Negative bacteria (including MRSA) Viruses, fungi and spores
- ✓ It can be used with all the usual positive and negative-pressure therapies
- ✓ Inhibits the degranulation of mast cells,
- ✓ Stop the release of inflammatory chemicals, such as cytokines & histamine.
- ✓ Promote fibroblast migration
- ✓ increase tissue oxygenation after 60 seconds of exposure to the wound bed
- ✓ No resistance
- ✓ Hypoallergenic



مستشفى الزهراء دبي
AL ZAHRA HOSPITAL DUBAI
Care in Style رعاية راقية

SERGIO MAZZEI
WOUND CARE

**From every
wound
there is a scar,
and every scar
tells a story.
A story that says,
"I survived."**

...we hope so for our patients...

www.drsergiomazzei.health