WOUND DRESSINGS

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Wound Dressings

There are hundreds of dressings on the market, each company informing you that their product is the best. And as dressings become more complex they also become more expensive. Despite the complexity and the expense, there is no single dressing suitable for all wounds. Dressing selection comes down to what your wound is like, what your patient prefers/can tolerate and what you have access to.

First you need to consider what it is you want from a dressing. Consider:

- Moisture management - Absorbs and removes excess exudate while providing a moist environment for healing
- Temperature management
- Bioburden management – Provide a barrier to pathogens or have bactericidal/bacteriostatic properties.
- Does not promote infection
- No dead-space
- Protection - Promotes against mechanical trauma (pressure, shearing)
- Odour Control
- Pain management
- Beautify
- Allows gaseous exchange if appropriate
- Does not leave residual fibres or toxins
- Does not cause hypersensitivity
- Is simple to apply and easy to remove (atraumatic)
- Comfortable to wear
- Adaptable to body parts
- Does not interfere with body function
- Is cost effective

It's also important to understand the difference between Generic dressing types and brand names. Dressing charts from individual companies will list the products by their brand name, but non-brand-specific charts (such as the NHS Formulary and the tables within this document) will use their Generic Names. By understanding the generic types and what they do you can apply that knowledge to any company's products. Some of the generic names are:

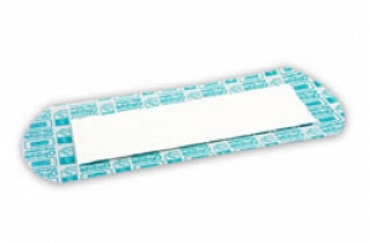
Natural Fibre
Hydrofibre
Non Adherent
Muti-layered
Island
Calcium Alignate
Semipermeable
Odour Absorbing
Tulle Gras
Hydrogels
Transparent Silicon
Hypertonic Saline
Foam
Monosaccharide
Polyurethane/Surfactant
Interactive Wet
Cellulose Dressing
Zinc
Cadexomer Iodine
Negative Pressure
Polyacrylate Fixation Sheet
Antimicrobial & Antibacterial

There can also be combinations of these dressings where manufacturer's are attempting to combine the benefits of different materials, such as combining a tulle gras with an antimicrobial to make an antimicrobial, non-stick dressing – Atrauman Ag, Bactigras, Inadine. Knowing, however, that each of these is still a tulle gras will inform the clinician that no matter which one is chosen it will not absorb exudate, will require a secondary dressing and may promote hypergranulation.

The following table helps to explain the different strengths and weaknesses of the various generic dressing types. It does not tell you what to use, but it does give you the strengths and weaknesses of the dressings you may have to choose from. There is also a dressing selection grid in Appendix A that may be useful.

Island dressings

These are slightly absorbent non-adherent pads that can have a cloth or film an adhesive cover. These are often used to protect surgical incisions or recently healed wounds. While these are low adherent, there is still a chance they will stick to the wound, particularly if there has been bleeding which has since dried. Adhesive removers should be used to ensure the removal of the cloth tape without damaging the surrounding skin.



Examples	Indications	Advantages	Disadvantages	Contraindications
Primapore **Mepore** **Opsite post-op** **Compose**	Acute surgical incisions. Wounds healing by primary intention or low exudating wounds	Cheap. Absorbs some wound fluid, maintain a sterile environment and provides a protective barrier against further trauma	Unable to absorb high amounts of exudate Removal may cause trauma to surrounding tissue	Moderate to highly exudating wounds

Film

Films are semi-permeable, thin, adhesive, transparent polyurethane film dressings. These are most often used to secure intravenous devices. These allow water vapor and gas to escape but do not allow water to enter. Can be used as a secondary dressing to make the primary dressing "water-proof". Do not put tension on the skin when applying as this can result in tension blisters. When removing, gently stretch the dressing, this will break the adhesive bond making easier to remove without causing trauma to the surrounding skin.

Examples	Indications	Advantages	Disadvantages	Contraindications
OpSite, Tegaderm	Superficial wounds. As a secondary dressing.	Some moisture evaporation, Reduces pain. Barrier to external contamination. Allows inspection.	Exudate may pool, may be traumatic to remove.	Moderate to high exudative wounds.

Interface

A cotton, rayon, mesh, viscose or gauze open weave material that has been impregnated with paraffin or similar non-adherent, they are also known as Tulle Gras dressings. The paraffin assists in keeping the area moist, so it is good for skin grafts and assisting in re-epithelialization. Mainly these are used to reduce adherence to the wound bed. They do require a secondary dressing.

Examples	Indications	Advantages	Disadvantages	Contraindications
Jelonet, Interpose Mepitel (silicone)	Wounds healing by secondary intention, superficial clean wounds	Reduces adhesion to wound. Moist environment aids healing.	Does not absorb exudate. Requires secondary dressing. May promote hypergranulation.	Allergy to paraffin products Allergy to silicone products

Simple - low exudate

Non adherent, dry, thin perforated plastic film coating attached to an absorbent pad. These are not non-stick, if there is bleeding/exudate that has dried these WILL stick to the wound bed. They are used the same as the island dressings (and are often the "island" in the middle of the adhesive). These can also be a low absorbent secondary dressing. If, however, you are worried about sticking to and tearing skin, perhaps consider a silicon dressing.

Examples	Indications	Advantages	Disadvantages	Contraindications
Melolin Interpose	Wounds with moderate exudates Epidermal wounds or wounds healing by primary intention	Cheap. Low wound adherence. May absorb light exudate.	Not suitable in high exudate and can macerate surrounding skin. Can dry out and stick to wound.	Dry wounds (may cause tissue dehydration)

Highly Absorbent

There is a broad variety of absorbent inner materials as well as coverings. The inner materials can vary from simple cotton to alginates to high absorbency gels that lock away large amounts of fluid. The outer coverings can also be simple fabric (like a combine) to complex low-adherent or hydrophilic coverings. The aim of these dressings is to remove excess moisture from the wound bed, but like all good dressings, they try to maintain a certain level of moisture at the wound interface. In very heavy exudate situations where you need a secondary dressing, or the absorbent is not going over any wound or on any broken skin, and you need the skin to be DRY, consider the use of incontinence aids. The incontinence aid is designed to keep the skin dry, not moist.

Examples	Indications	Advantages	Disadvantages	Contraindications
Mesorb Combine Zetuvit Exudry Mextra	Only use on minor wounds or as secondary dressings	Absorbent. Does not shed fibres.	Often sticks to wound surface and disrupts wound bed when removed. Creates a dry wound.	Light to moderate exuding wounds

Alginate

Natural polysaccharide from seaweed that turns to a gel on contact with wound fluid. The way the fibres function, the exudate is absorbed into the entire dressing – it is very absorbent – and the resulting gel maintains a moist wound contact interface. But because the entire dressing will fill with fluid, it needs to be cut to the size of the wound and not be allowed to sit on the periwound skin where it could cause maceration. If it is allowed to dry it can stick to the wound bed and be very difficult/traumatic to remove. The alginates which are Calcium Alginates are often used to assist in stopping bleeding. If you have stopped a bleed with it, either attempt to remove it while it is still moist or leave it for several days and even then be very careful, otherwise removing it will start the bleeding again. These are often used on a donor site to help stop the bleeding and then are left in place for weeks!

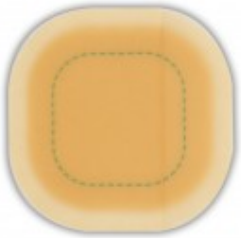
Examples	Indications	Advantages	Disadvantages	Contraindications
Kaltostat **Sorbsan** **AlgiSite M**	Moderate to high exuding wounds and for wounds with minor bleeding. Chronic wounds: leg ulcers, pressure ulcers, diabetic ulcers Acute wounds: donor sites, abrasions.	Forms gel on wound keeping environment moist. Reduces pain. Packs cavities. Absorbent in exudative wounds. Haemostasis.	May require secondary dressing. Gel can be confused with slough or pus in wound.	Kaltostat not suitable for use in infants less than 12 months Dry wounds or hard eschar Sensitivity

Foam

Foams are made from a variety of materials, with or without adhesive layer. The aim of the foam is to manage exudate (absorb and evaporate), cushion the area and keep the wound environment warm. Many foams have also been combined with other things to broaden their use such as silicone (Mepilex), surfactants (Polymem), gelling fibres (Aquacel Foam) and various antimicrobials. Due to the varied nature, they amount of moisture they hold to the wound surface will vary; this may impact on which foam you choose for your plan.

Examples	Indications	Advantages	Disadvantages	Contraindications
Allevyn **Mepilex** **Biatain** **PolyMem** **Aquacel Foam**	Wounds with low to high exudate.	Moist wound environment, highly absorbent and protective Permeable to oxygen and water vapour	Will not debride hard exudate	Dry wounds. Necrotic wounds or hard eschar.

Hydrocolloid



These are dressings that contain a gelling agent (like sodium carboxymethylcellulose and gelatin). They absorb any wound exudate and hold it, maintaining a very high moisture interface with the wound because of their lower vapour transfer rate[(1)]. However, they can not handle high amounts of exudate (the amount they can manage will be directly proportional to the thickness of the hydrocolloid) and when the exudate exceeds the capacity of the dressing it will leak out the side.

The hydrocolloid dressings are also water proof and reasonably flexible. These can be used as secondary dressings over gelling fibres, alginates or foams to add adhesiveness, water-proofing and increasing moisture levels under the bandage (so a lower exuding wound can still get the benefits of a gelling fibre without drying – for example).

When applying the hydrocolloids, hold them to the skin for a few seconds to warm them up and encourage them to mold and adhered to the skin. These should not be used if the dressing it to be removed regularly (daily or second daily) as the adhesive can be very strong and will damage the skin. Also note that once they absorb exudate they can appear very off-putting when you remove them, they will have a bad odour (once lifted off the skin) and the fluid under the dressing can look like infected pus (when it's not).

Due to their very occlusive nature they create a hypoxic environment under the dressing. This can encourage VEGF production (good) but can also result in hypergranulation (not so good). Also, if there are any anaerobes trapped under the dressing they will thrive in the warm, moist and oxygen depleted environment. Therefore, if it is possible that the wound is heavily colonized or infected, do not use a hydrocolloid.

Examples	Indications	Advantages	Disadvantages	Contraindications
Duoderm Comfeel	Not for highly exuding wounds but can be quite versatile otherwise, especially in combination with other dressings	Waterproof. Conforms well to wound. Gel formation provides moist wound environment	Avoid on high exudate wounds Gel mistaken for wound infection	Dirty wounds Infection Wounds where muscle, tendon or, bone exposed If wound requires frequent changes

The absorbent acrylic is another type of dressing that has similar properties and should be treated as a hydrocolloid. It's halfway between a clear film and a hydrocolloid. It appears to have the higher vapour transfer rate of the film (and is see-through) but it also mildly absorbent.

Hydrogel

Composed mainly of water in a complex network or fibres (like alginate fibres) or an insoluble polymer that keeps gel intact. The gel can be on it's own (in a tube) molded into a flexible sheet, or impregnated into a gauze dressings. Water is released into the wound bed to keep the wound moist. Because this contributes moisture you need to be aware of the risk of periwound maceration and take precautions. Also, these gels generally have a short useful life span and will need to be refreshed daily. There are some exceptions to this rule with new versions in combination with antimicrobials and/or longer lasting hydrating properties so be sure to read the manufacturer's instructions before use.

Examples	Indications	Advantages	Disadvantages	Contraindications
Intrasite **Solosite** **Solugel**	Necrotic or sloughy wound	Creates optimal moist environment rehydrating wound bed and removing dead tissue. Reduces wound pain. Conforms to wound.	Potential to macerate surrounding tissue Requires additional secondary dressing to secure	Moderate to heavily exudating wounds Alllergy Superficial wounds Cavity or sinus where you can not see the entire wound bed

Gelling Fibre

Soft non-woven pad or ribbon dressing made from sodium carboxymethylcellulose fibres. These fibres do not allow the transfer of fluid laterally along the dressing. Therefore, if it is cut larger than the wound (so it covers the wound and the periwound skin) it will encourage the exudate to move directly into the secondary dressing and protect the periwound skin. It does need enough exudate to stay moist though, and if it dries will adhere to the wound bed (particularly at the border with the periwound skin).

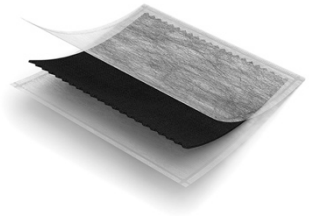
Examples	Indications	Advantages	Disadvantages	Contraindications
Aquacel **Durafibre** **Exufibre**	Lesions and cavity wounds acute and chronic Wounds healing by secondary intention	Interact with wound drainage to form a soft gel. Does not wick laterally. Absorbs exudate. Provides a moist environment	Secondary dressing needed	Dry and necrotic wounds

"Ribbon" versions are good for packing, especially if there is a risk of pressure to the cavity or sinus where a gauze packing would not compress/soften and could create a pressure point.

Odour absorbing

These do not appear to be as prevalent as they used to be. Perhaps we are getting better at managing the cause of the odour with new cleansing agents like Prontosan. The aim of these dressings is to reduce odour and can be done in a few ways:

- trapping the odour causing molecules in an active carbon matrix
- killing the odour causing bacteria with an antimicrobial
- trapping the exudate



Depending on the version, these dressings can not be cut. A good rule of thumb is that if it has a sealed edge it can't be cut.

Examples	Indications	Advantages	Disadvantages	Contraindications
Actisorb plus **CarboFlex** **Zorflex**	Malodorous wounds	Mask wound odours	May need a secondary dressing	Dressing not to be cut if it has a sealed border May adhere

Antimicrobials

Additives can improve existing dressing types, these are things like Silver, Iodine, Hypertonic Saline, PHMB, Chlorhexidine and Honey. Only a few examples are listed below.

Tulle Gras - Impregnated

Many types of tulle gras are also impregnated with antimicrobials – these should NOT be used on new surgical sites as antimicrobials have been shown to inhibit healing and a new surgical site should not be contaminated.

Examples	Indications	Advantages	Disadvantages	Contraindications
Bactigras **Xeroform** **Inadine** **Atrauman Ag**	Burns. Contaminated or infected wounds	Reduces adhesion to wound. Moist environment aids healing. Antiseptic therapy in contaminated or infected wounds.	Does not absorb exudate. Requires secondary dressing. May induce allergy or delay healing when impregnated	Allergy

There is also an interface dressing called Sorbact, which is NOT non-stick (does not have paraffin) and is not impregnated with any chemicals but is still anti-microbial. It uses hydrophobic materials to be attractive to micro-organisms which then migrate into the dressing instead of the wound.

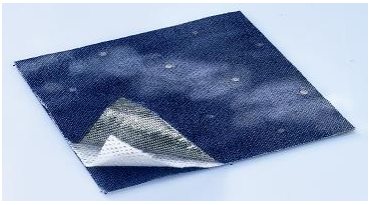
Hypertonic saline

These are gauze dressings impregnated with hypertonic saline. They encourage removal of exudate and debris from the wound through osmosis.

Examples	Indications	Advantages	Disadvantages	Contraindications
Curasalt (Curity) **Mesalt**	Wounds with excessive exudate. Moist necrotic, draining and infected	Wicks moisture away from wounds. Promotes autolysis, reduces odour.	May dry the wound out too much. May cause stinging and/or discomfort	Bleeding wounds or exposed tendon, bone or muscle

	wounds.			

Silver dressings



Dressings containing various kinds and doses of silver. If it is the metallic silver, this must be wet to allow the silver anions to enter the wound. Use potable water or water for injection as sodium chloride will de-activate the silver by binding to the silver anions.

Do not mix antimicrobials as they may interfere with each other and ultimately de-activate each other. So do not use something like Inadine under a Mepilex Ag. Apart from altering effectiveness it's also very expensive!

Examples	Indications	Advantages	Disadvantages	Contraindications
Acticoat **Aquacel AG** **Mepilex AG**	Infected wounds Burns	Bacteriocidal – kills pathogens such as MRSA and VRE	Questions remain regarding accumulation toxicity and resistance. Should be used with care.	Allergy. Some can't be used with oil based products or topical antimicrobial

Other options like PHMB, iodine (cadexomer and povidone), honey and surfactants have not been discussed here. The main thing to remember is that the additive is on top of an existing generic type, so it inherits the properties of that type. For example, a silver hydrofibre (Aquacel Ag) will be able to manage exudate whereas a silver interface (Atrauman Ag) will not. Find out what the additive is expected to do by reading both the manufacturer's recommendations and also doing some research for non-biased results (if possible) that show it can be used successfully in your patient population. And, as always, consult with the patient on preference as well.

A good reference is:
https://cms.qut.edu.au/__data/assets/pdf_file/0003/451767/Book2-wound-dressing-guide.pdf

Appendices

Appendix A - Dressing Guide

	None to Low	Low to Moderate	Moderate to High	High to Very High
Epithelial	Film Interface Simple dressing	Foam Hydrocolloid	High Absorbent	High Absorbent
	Antimicrobial/interface Antimicrobial/simple	Antimicrobial/interface Antimicrobial/Foam	Medicated bandage	Medicated bandage
Granulating	Film Hydrogel	Interface Foam Hydrocolloid	Alginate Hydrofibre	High Absorbent
	Povidone-Iodine Enzymatic Gel	Antimicrobial /Foam Antimicrobial/interface	Cadexomer-Iodine Antimicrobial/Alginate Antimicrobial/Hydrofibre	Antimicrobial/interface
Slough	Hydrogel	Foam	Alginate Hydrofibre	High Absorbent
	Enzymatic Gel Cadexomer-Iodine	Enzymatic Gel Cadexomer-Iodine Antimicrobial/Foam Curasalt (Curity)	Antimicrobial/Alginate Cadexomer-Iodine Mesalt	Antimicrobial/interface
Necrotic	Hydrogel Hydroactive	Hydrocolloid	Foam Alginate	High Absorbent
	Povidone-Iodine Antimicrobial/Hydroactive	Cadexomer-Iodine	Cadexomer-Iodine Antimicrobial/Foam Antimicrobial/Alginate	Antimicrobial

This table has been modified from those used in the NHS

Example Dressings

Generic	**Brand**	**Generic**	**Brand**
Film	Tegaderm Opsite	Medicated Bandage	ZipZok
Interface	Jelonet	Antimicrobial/ Interface	Bactigras Sorbact Acticoat
Simple	Primapore Compose	Antimicrobial/Simple	Kendall AMD island dressing
Hydrogel	Solosite	Antimicrobial/ Hydrogel	Hypergel (also consider enzymatic gels)
Hydrocolloid	Comfeel Duoderm	High Absorbent	Combine Zetuvit Incontinence Aid
Enzymatic Gel	Flamminal Hydro Honey	Cadexomer-Iodine	Iodosorb Paste Iodosorb Powder
Foam	Allevyn Mepilex *(for delicate skin only)*	Antimicrobial/Foam	Kendall AMD Foam Allevyn Ag Mepilex Ag *(for delicate skin only)*
Alginate	Kaltostat	Antimicrobial/ Alginate	Silvercel
Hydrofibre	Aquacel	Antimicrobial/ Hydrofibre	Aquacel Ag

Other considerations not listed above:

Skin Protector

- Cavilon
- Menalind
- White paraffin

Cavity

- Alginate
- Hydrofibre

Bleeding

- Ca Alginate

Malodorous

- Charcoal

Wound Closure

- Steristrips

Irrigation

- Prontosan

Hypergranulation

Foam

References

1. Wu, P., et al., *Water vapour transmission rates in burns and chronic leg ulcers: influence of wound dressings and comparison with in vitro evaluation.* Biomaterials, 1996. **17**: p. 1371-1377.