

Dress for Success

Dot Weir, RN, CWON, CWS
Catholic Health Advanced Wound Healing Centers
Buffalo, New York

The Ideal Dressing

- Manages exudate appropriately: Does not desiccate or macerate
- Allows for gaseous exchange
- Thermally insulating
- Impermeable to bacteria, minimizes contamination
- Free from particulate or toxic contamination
- Non-traumatic, non- or minimally painful on removal

The Ideal Dressing

- Provides environment for healing
- User friendly; ease of application
- Cost-effective
- Compatible with support needs (i.e. compression wraps)
- Minimizes need for secondary dressing when able
- Remains in place for expected time frame

Wound Bed Preparation

**“chance favors the prepared ~~mind~~”
wound”**

Louis Pasteur

- Wound Cleansing
- Wound Debridement
- Bioburden Management

Dressing Considerations: 9 Guiding Principles

Principle #1

- Is the wound healing?
 - Yes -Proceed with best practice treatment
 - No- Consider other etiologies, interventions, turning/offloading, bioburden, intrinsic/extrinsic factors, co-morbidities
- Flanagan noted that 20% to 40% reduction in 2 and 4 weeks is likely to be a reliable predictor of healing
- Sheehan, et al found that a 50% reduction at week 12 is a good predictor for persons with diabetic foot ulcers
- Margolis, et al found that if the wound is not 30% smaller by week 4, it will not heal by week 12

Expect to see progress toward wound healing within 2-4 weeks of treatment initiation

Principle #2

Is the tissue viable or necrotic?

- Viable- support it and keep it moist



- Necrotic- debride if appropriate using principles of WBP; consider patient and wound factors



Principle #3

Provide optimal amount of moisture

Is the wound 'wet'?

- Select product that manages exudate while maintaining optimal amount of moisture at wound bed

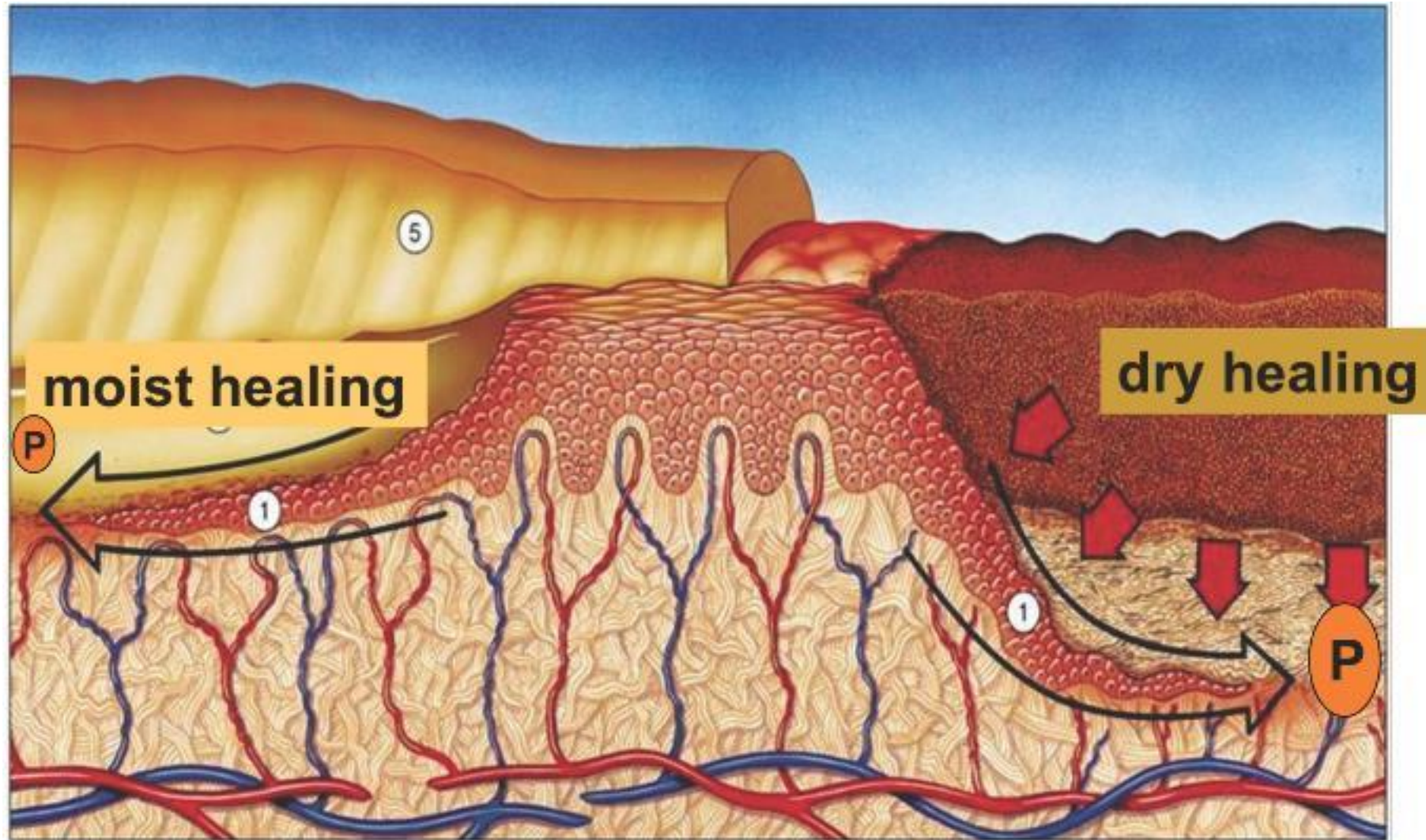


Is the wound 'dry'?

- Select a product that donates or maintains an optimal amount of moisture



Epithelial Healing of Deep Skin Wounds



Winter GD. Formation of the scab and the rate of epithelialization of superficial wounds in the skin of young domestic pigs.
Nature. 1962;193:293-294.

Epithelial Migration Beneath a Blister



Principle #4

Is there dead or open space?

If it's deep, fill it

If it's filled in, cover it



Principle #5

What is the condition of the periwound skin and wound edge?

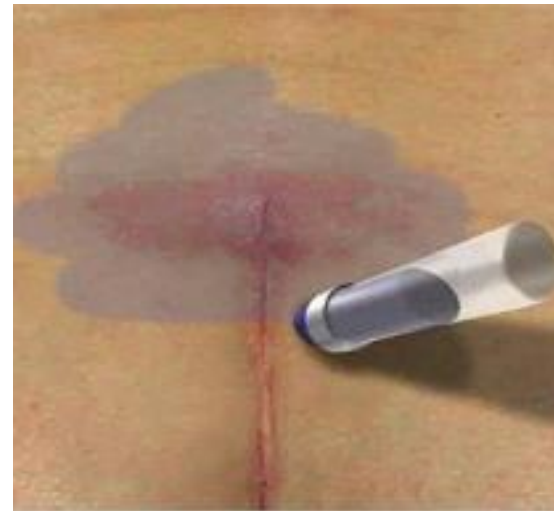
Goal: Intact!

- If it is compromised, avoid adhesives
- Always use protective wipe or sealant
- Consider use of protective products and adhesive remover



Protect Surrounding Skin

- Formulations to protect skin from mechanical injury and stripping.
- Most are a polymer with a solvent and when the solvent evaporates there is a film left on the skin
- Available with or without alcohol
- Available as a long wearing cyanoacrylate



Exudate: Protecting Periwound Skin



Principle #6

Is the wound and/or surrounding area edematous or indurated?

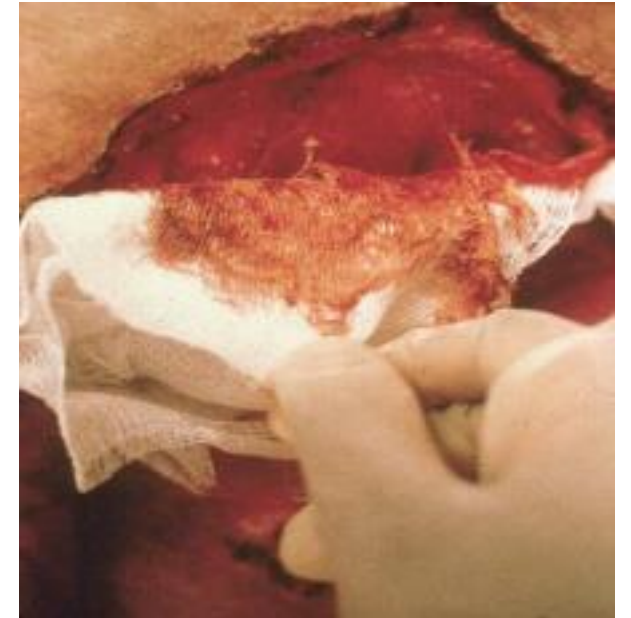
- Many wounds have associated edema beyond the inflammatory phase
- LE wounds often have an associated venous hypertension/lymphatic compromise
 - Manage the edema- compression, exercise/calf pump



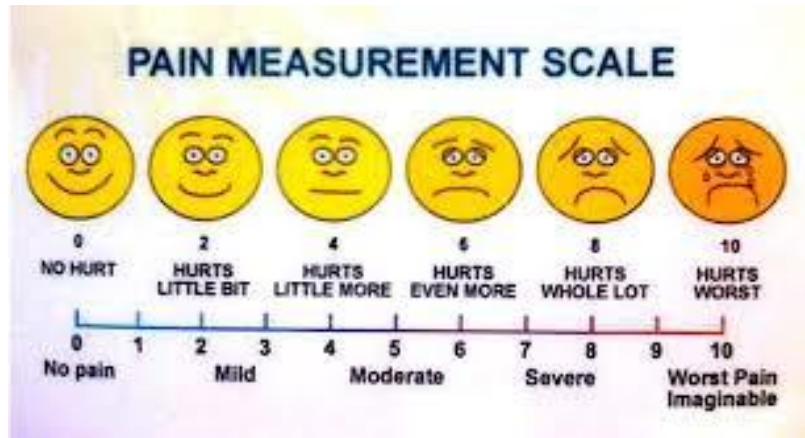
Principle #7

Is the wound painful? What is impact on patient's QOL?

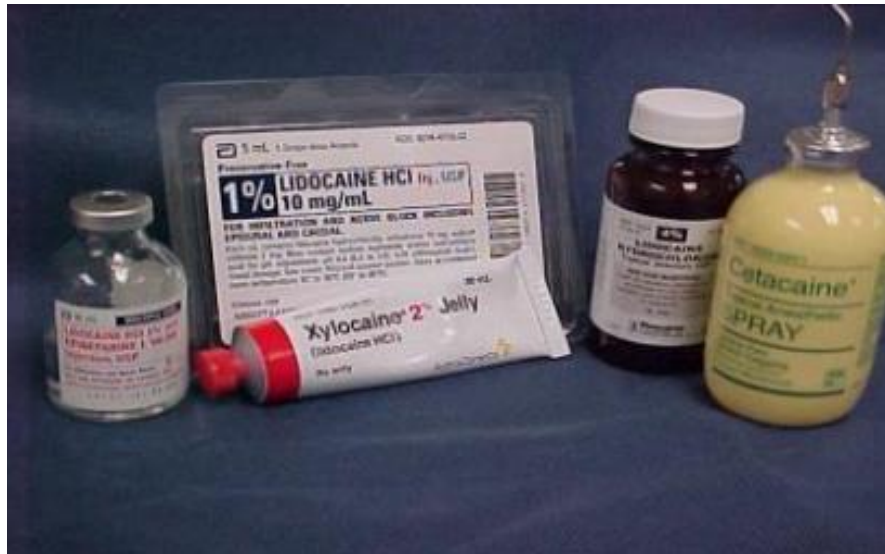
- When did the pain start?
- What is potential source of pain? Root cause...
- Is the pain constant or only during procedures and/or dressing changes?
- Pay attention to non-verbal cues



Plan for the Pain



- Nursing - pre-medicate patient
 - Others: Call ahead!
 - Medicate prior to leaving facility for procedure
 - Take once at appointment if they have a driver
- Use topical anesthetics



Avoid Verbal Anesthesia

- “It’s almost over”
- “It’s OK”
- “Try to calm down”
- “Don’t move!”
- “I’m sorry!”



Principle #8

Does the wound have an odor?



- Does odor remain after wound cleansing?
- When did the odor begin?
- Does the wound appear infected or critically colonized?
- Is there necrotic tissue in the wound bed?
- Identify cause and eliminate it
- Increase wound cleansing
- Consider use of safe antimicrobial cleanser or antiseptic such as hypochlorous acid, Dakin's or acetic acid
- Utilize broad spectrum antimicrobials if indicated
 - Silver, PHMB, Honey
- Metronidazole gel has been useful to eradicate anaerobic infection and odor
- Activated charcoal dressings

Principle #9

Is the wound stalled?

- Has progress ceased?
 - Is it critically colonized?
 - Has something changed in/with the patient?
 - Exogenous
 - Endogenous
 - Iatrogenic factors



Need to jumpstart the wound healing cascade

Remember...Teach the patient!

- A lot to overcome about wounds from growing up....
 - Let it “breathe”
 - Let it dry out and scab
 - Don’t pick your scabs
 - Soak it
 - “Boil” it with peroxide
 - Coat it with mercurochrome or iodine



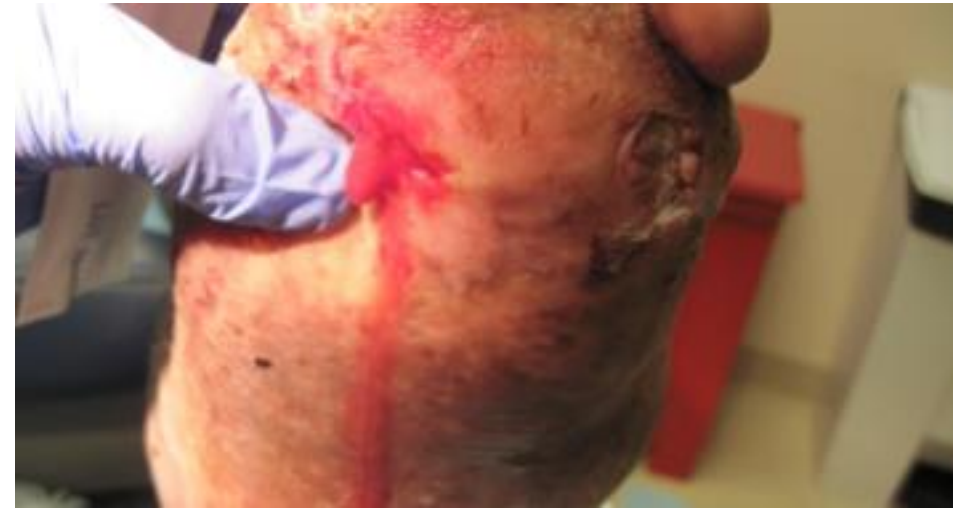
Consider: Location



Size



Exudate



Tissue Type



Support Needs



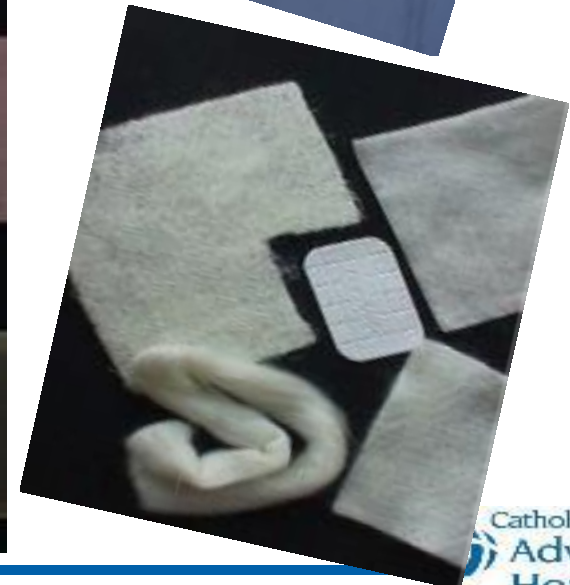
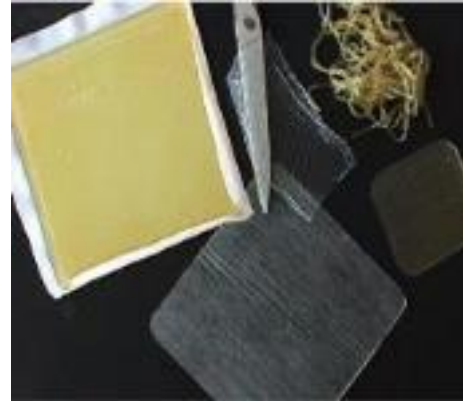
Dressing category review



Dressing Functions

	Films	Hydrogels	Alginates / Gelling fiber dressings	Foams	Hydrocolloid
Cover/Protect	✘	✘		✘	✘
Hydrate		✘			
Maintain Moisture / Autolytic Support	✘	✘	✘	✘	✘
Absorption			✘	✘	
Fill Space		✘ Impregnated gauze	✘		

Addressing the Wound Environment



Dressing Outcomes

- Obliteration of dead space
- Absorption of exudate
 - Protection of periwound skin
- Maintenance of moist environment
 - Autolytic support
- Protection and insulation
- Bacterial barrier/bacterial management



Hydrogels

- Dressings have high water or glycerin content which enables them to add moisture
- Aids autolytic debridement
- 3 forms
 - Amorphous (in a tube)
 - Impregnated into gauze
 - Solid sheets



Film Dressings

- Transparent polyurethane adhesive dressings
- Non-absorbing
- Cover and protect vulnerable areas, newly healed skin
- Moisture vapor permeable, exudate will be remain beneath dressing
- Often used as secondary dressing; waterproof



Hydrocolloids (DuoDerm)

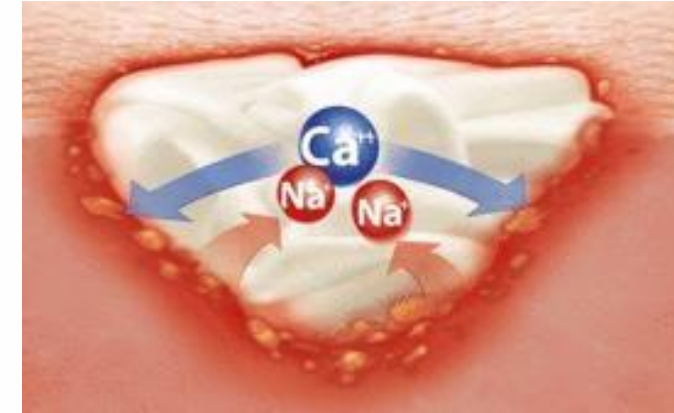
- Wafer type dressings consisting of gel-forming agents
- Self adhering
- Mildly absorbing, form gel mass over wound bed
- Promote autolytic debridement



Calcium Alginates

Gelling Fiber Dressings (Aquacel)

- Highly absorptive filler and cover dressings
 - Gelling fibers reportedly more absorbent
- Good for moderate to large amounts of exudate
 - Will adhere to low moisture wounds
- Require secondary dressing



Copyright Medetec (<http://www.medetec.co.uk>)

Foams (Allevyn)

- Mostly polyurethane (polyvinyl alcohol foams in antimicrobials)
- Multiple levels of absorbency
- Available with and without borders and adhesive
- Several available with silicone adhesive
- Moderate to large amount of absorption



Tenderwet

- Helps create an ideal moist healing environment
 - Ringer's solution creates a gentle rinsing effect
- Absorbs harmful bacteria and dead tissue
- Easy application and removal
- Sterile, latex free
- High fluid retention



Pigmented Foam Dressings

- Antimicrobial dressing
- Polyvinyl alcohol (PVA) foam with organic pigments
 - Methylene blue (≤ 0.00025 gr/gr)
 - Crystal (Gentian) violet (≥ 0.00025 gr/gr)
- Polyurethane foam with film surface
 - Available with silver
- Effective against common wound pathogens
- Changed every 1-3 days



Pigmented Foams

- In clinical use, PVA foam has been used to reduce hypergranulation tissue and to flatten slightly rolled wound edges.
- Compatible with exogenously applied collagenase



Weir D, Schultz G. Assessment and Management of Wound-Related Infections. In: Doughty DB, McNichol LL. (eds) Wound Ostomy and Continence Nurses Society Core Curriculum. Wolters Kluwer Philadelphia PA. 2015 156-180.



Bacterial Burden

- Silver (all dressing categories come with Ag option!)
- Cadexomer Iodine
- Pigmented Foam
- PHMB (Polyhexamethylene Biguanide)
- Honey
- DACC



Silver

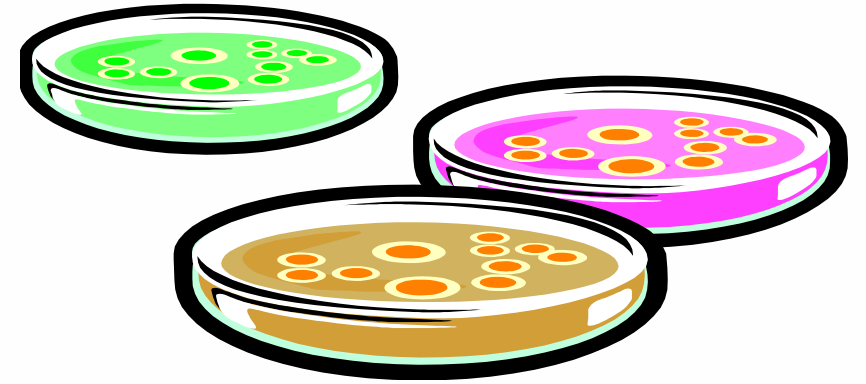


Silver



Antimicrobial Action of Ag+

- Broad spectrum of antimicrobial action
 - Gram positives
 - Gram negatives
 - Aerobes/anaerobes
- Ag+ can kill antibiotic-resistant bacteria
 - MRSA, VRE
- Effective against fungi



Honey

- Wound treatment for many centuries
 - Mentioned in the Bible, the Koran, and the Torah
 - Documented by the Egyptians in 2000 BC noted use in plasters
 - Another document from 1392 documented use of honey in wound care practices



Mechanism of Action

- Antibacterial
 - Provides barrier on wound surface to prevent bacterial colonization and penetration
 - Antibacterial activity has been shown to vary with the plant source
- Anti-inflammatory
 - Noted reduction in edema and pain
- Wound Healing
 - Moist wound environment created by the osmotic effect of the honey
 - Autolytic debridement

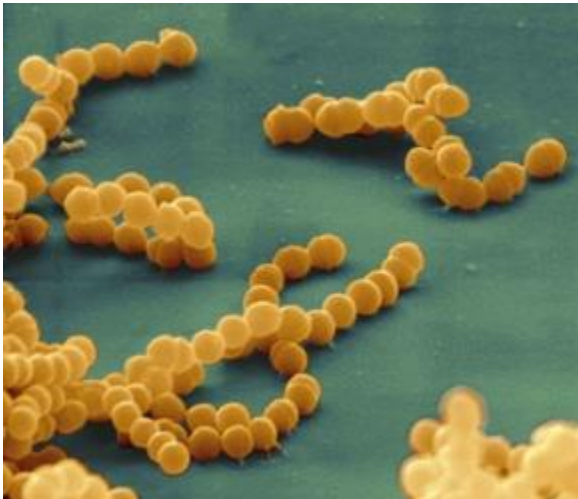
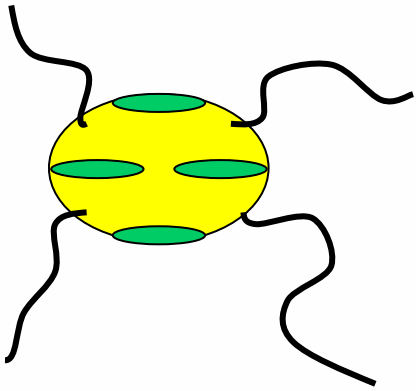
DACC (dialkyl carbamoyl chloride)

Also known generically as pathogen binding mesh

- Not “technically antimicrobial”



Hydrophobicity of Microbes

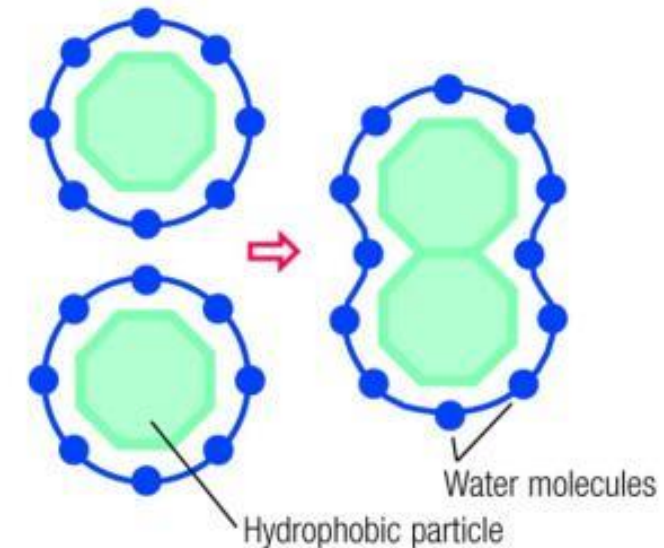


- Wound pathogenic bacteria and fungi express cell surface hydrophobicity because of certain hydrophobic structures on their cell surfaces
 - For cell-to-cell communication (eg, DNA exchange)
 - To bind to molecules for nutrition
 - To bind to surfaces to rest
 - For protection against phagocytosis
 - To adhere to host tissue (eg, in the initial phase of wound infection)

Hydrophobic interaction is essential for microbial life

DACC Layer is Hydrophobic

- DACC is a hydrophobic (water repellent) fatty acid derivative; it coats the dressing materials giving it highly hydrophobic properties.
- Once bound to the dressing, bacteria and fungi are inactivated and prevented from proliferating or releasing harmful toxins
- At each dressing change, microorganisms are removed from the wound bed along with the dressing, reducing the bacterial load.
- Must be moistened
- Removed from wound in toto

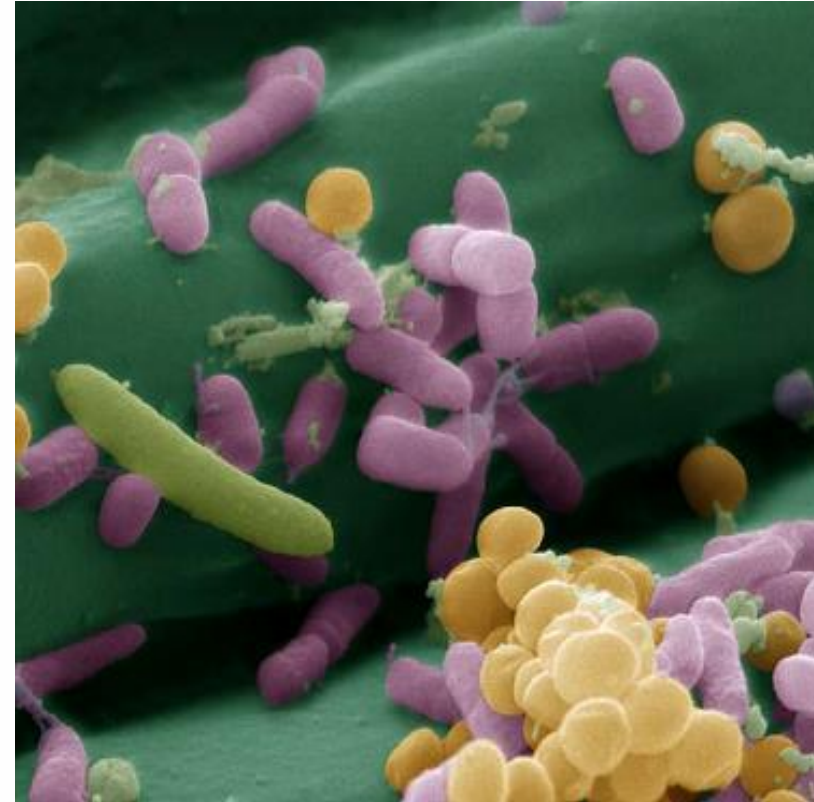


Bacteria and Fungi Binding to DACC Fibers

Magnification x 2,000

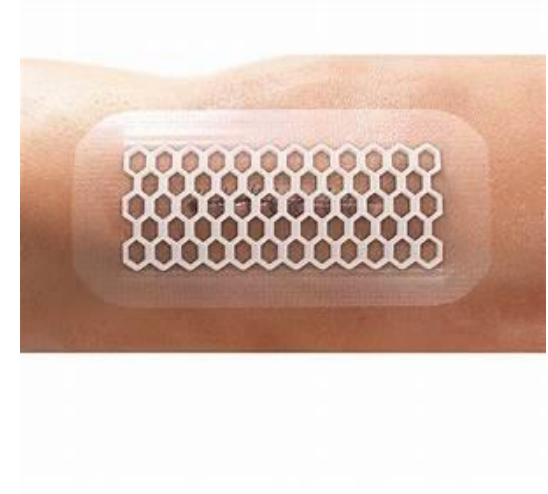


Magnification x 15,000



**Staphylococcus aureus (yellow), Pseudomonas aeruginosa (purple),
Enterococcus faecalis (blue), Klebsiella species (green), Candida albicans (orange)
are bound to the Sorbact dressing**

Post-Op Dressings



Superabsorbents

- Newer class of absorbent dressings
- Available in various forms, including layered polymers, foams and fibers
- Core fluid locking material that may include powders, crystals, chitosan or gelling agents
- Designed to wick larger amounts as well as more viscous exudate away from the wound surface



Combination / Multipurpose Dressings

- Combine attributes of more than one category of dressing
- May be described as “multi-functional” or self adaptive
 - Absorbs as well as donates moisture

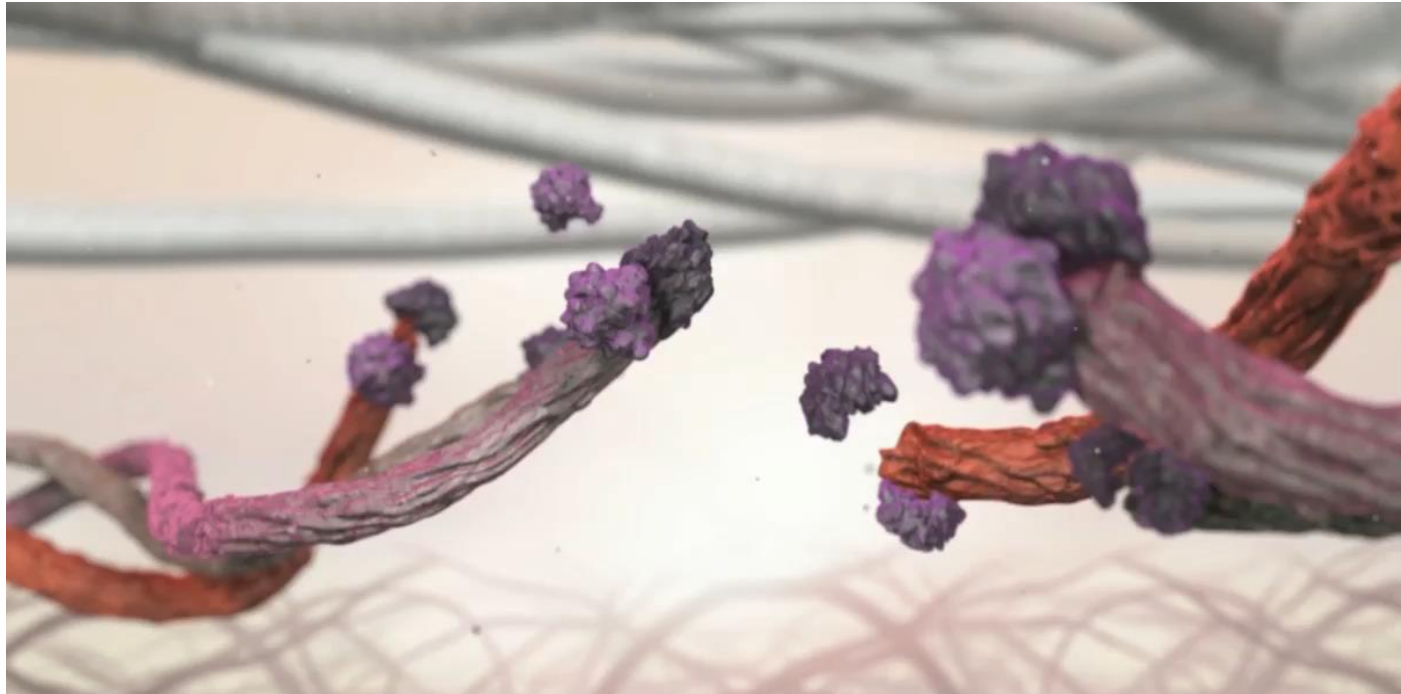


Collagen Wound Dressings

- Collagen is a biologically derived material
 - Source can vary
- It is the basic structural material of the body
- It is bioresorbable/biodegradable
- Collagen's primary function is NOT related to exudate management or moisture retention
- Role of Collagen
 - To guide tissue in-growth
 - To attract cells to the wound site
 - To increase cellular proliferation in the wound site

Role of Exogenous Collagen

- Hemostasis
- Modulates effects of excess matrix metalloproteinases; acts as sacrificial substrate
 - Binds to MMPs without releasing them
 - Binds to growth factors and releases them



Resources for Dressings

<http://www.woundsource.com>



[STUDENTS](#)

[FACULTY](#)

[RESOURCES](#)

[ABOUT](#)

[REGISTER](#)

Why Wound Care?

For Medical Students

MEDICAL STUDENTS

