Advance Wound Management in Community Nursing

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Program Objectives

- Understand evidenced-based protocols of care for prevention and management of pressure ulcers, lower leg wounds and diabetic foot ulcers

- Describe appropriate products that can be used based on wound characteristics, depth, and etiology

Goals

- Promote Ideal Wound Environment
  - Moisture control
  - Thermoregulation
  - Protect from infection
  - Patient comfort
  - Cost Effective

Moist Wound Environment

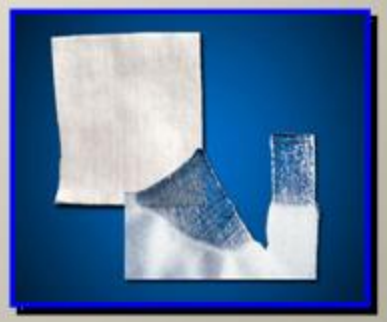
Too dry the wound can not heal

Too wet the wound will not heal and there can be peri-wound skin maceration

A review of 99 studies indicated*

- Hydrocolloids were better for healing chronic wounds than saline moist gauze or paraffin gauze for complete healing
- Hydrofibers and foams reduced the time to healing in comparison to other traditional dressings

Product Used to Help Maintain Moisture Balance in the Wound

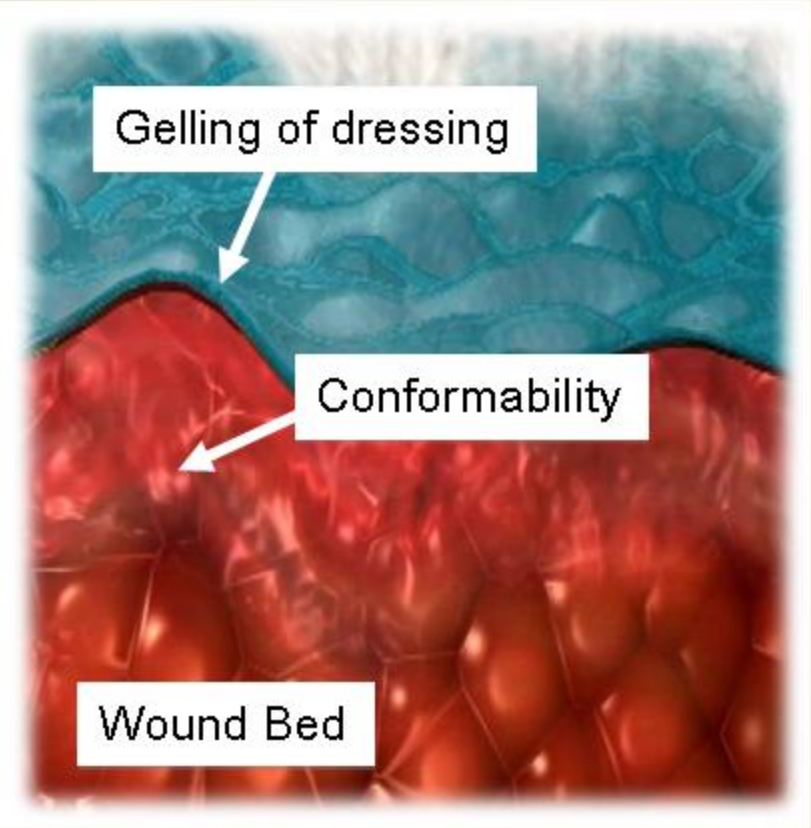


Refer to product insert for complete information on indications and use of each product.

Hydrocolloids

- formulation that has an adhesive, is permeable by moisture vapor and provides a semi occlusive barrier against bacteria, viruses, dirt and water. Dressing is indicated for the management of lightly to moderately exuding wounds.

Hydrofibers



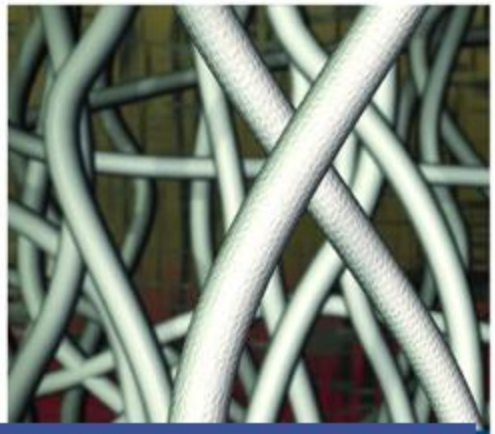
Hydrofiber® Technology: unique gelling properties

The unique gelling properties of Hydrofiber® dressings demonstrated in vitro include:

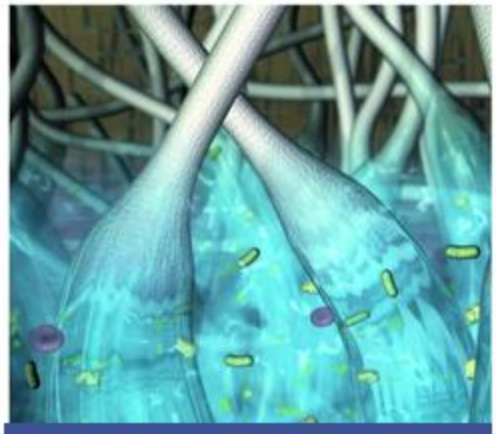
- Absorbing and retaining fluid[1]
- Reducing lateral wicking and risk of maceration[1,2]
- Sustaining hydration for a moist wound environment[1]
- Conforming to wound bed
- Non-traumatic removal[3]

1.

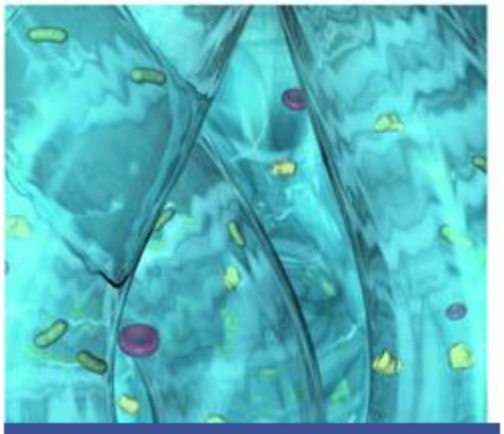
A Nonwoven Dressing With Hydrofiber Technology



1. Hydrofiber® Technology before application to a wound

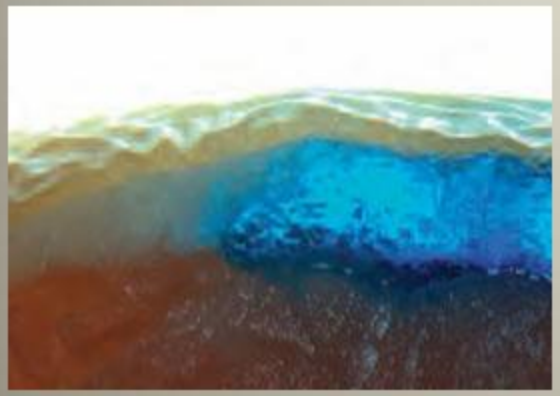
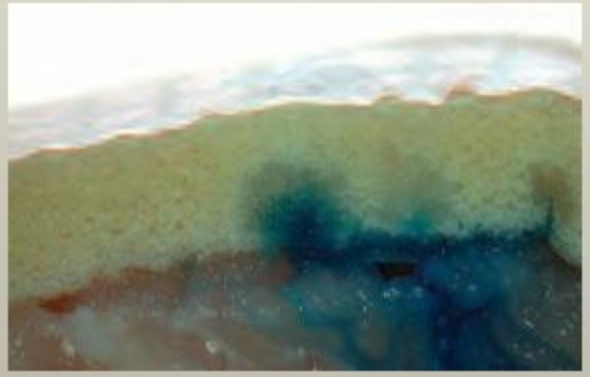
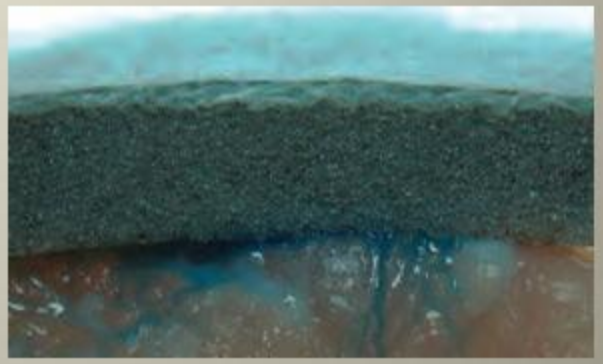


2. Transforming into a gel on contact with exudate



3. Locking in exudate and harmful components contained within exudate, keeping them away from the wounds

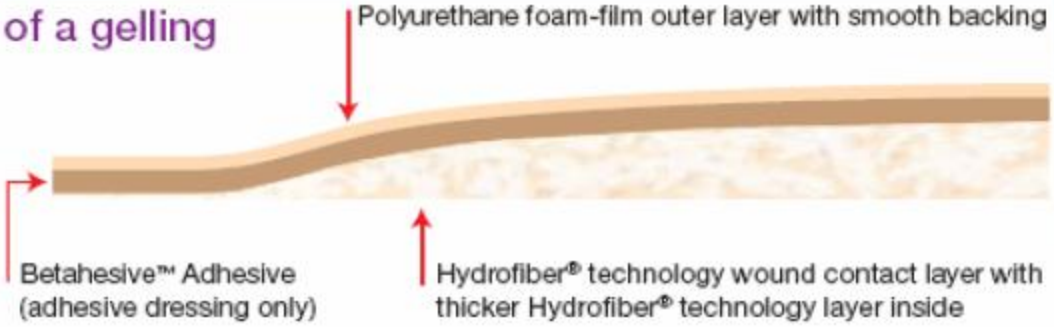
Tissue Conformability Model

As dyed saline was made available at the dressing/tissue interface it was observed that the SCHD rapidly gelled and conformed to the tissue surface (left). In comparison both Foam A and Foam C dressings were observed not to conform as closely to the tissue surface (middle and right respectively), and there was evidence of fluid accumulation within the “open” non-contact spaces.

Composite Foam Dressing

See the innovation of a gelling foam dressing



- **Composite foam** Dressing combines ConvaTec patented Hydrofiber® Technology and foam to
  - Absorb *and* Retain fluid[7] to help protect periwound skin
  - Help facilitate non-traumatic removal
  - Support healing in a protocol of care[8]

Maceration can be frustrating

*

Retention reduces the risk of maceration

- Versiva® XC™ Dressing provides superior fluid retention[7]
  - As demonstrated under separate in vitro testing
- Retains significantly more fluid under 40mm Hg pressure than all other traditional non-adhesive foam dressings tested ($p<0.05$) [7]

Versiva® XC™ Non-Adhesive Dressing

Photo used with the kind permission of Esperanza Manzanero and Salomé Fernandez. The photo represents one wound and may not be typical of all wounds.

* Dressings products tested include: Allevyn Non-Adhesive, Biatain Non-Adhesive, and Mepilex

Composite Foam Dressing supports healing in a protocol of care

Versiva® XC™ Non-Adhesive Dressing
Photo used with the kind permission of Esperanza Manzanero and Salomé Fernandez. The photo represents one wound and may not be typical of all wounds

- In a protocol of care for leg ulcers in a non-comparative, 4-week, clinical study*[8]
  - 89% of clinicians reported that their patients' leg ulcers had healed or improved at final evaluation*
  - 50% decrease in mean wound size from baseline to final evaluation*

*using protocols of care that included Verisva® XC™ Gelling Foam Dressing with compression and concomitant medications including topical steroids and corticosteroids (4.3% of patients), antibiotics and antibacterials (2.2% of patients), and leg ulcer treatments (2.2% of patients).

Wounds too wet can macerate the skin and set up for infection

Negative Pressure Wound Therapy

- Uses negative atmospheric pressure[21]
- Creates a moist wound environment[21,22]
- Removal of wound exudate, which is the medium for bacterial colonization[5]
- Promotion of granulation tissue[5]

GATHER ALL SUPPLIES

- Large black sponge
- A sheet of 8X8 Hydrocolloid Extra Thin sheet, cut into strips
- NPWT drape, cut into strips
- Stomahesive powder
- Protective wipe

PATIENT PLACEMENT
08/17/05

- **Position the patient on the left side**
- **Right leg bent forward**
- **Second person is needed to steady the patient and hold the buttocks up for cleaning, assessment and NPWT placement**

REMOVED DRESSING AND CLEANSE WOUND

- Rinse wound well with normal saline
- Dry periwound skin well
- Apply Protective Barrier Wipe to periwound skin

NPWT SPONGE PLACEMENT

- Cut sponge to fit wound
- Apply stomahesive powder to skin and dust off excess

NPWT PLACEMENT

- Begin securing the sponge with strips of NPWT drape at the top of the wound working toward the bottom of the wound

NPWT PLACEMENT

- Apply Hydrocolloid Extra Thin strips to the periwound skin at the bottom edge of the wound.
- Secure in place by holding the Hudrocolloid Extra Thin strips in place for approximately one minute

NPWT PLACEMENT

- **Continue to apply the remainder of the drape strips over the sponge and the Hydrocoiilod Extra Thin**
- **Hydrocolloid Extra Thin is not occlusive and must be covered with the NPWT drape**

NPWT PLACEMENT

- Once all the edges of the sponge are covered with the NPWT drape then attached the NPWT track pad at the lower edge of the wound
- Set NPWT parameters per orders

Wound
09/14/05

Hydrofiber AG rope

- Strengthing fibers

  20 times increased strength
- Absorbs 30 times it's weight in exudate,
- Maintains contact with wound bed providing

  moisture

Rolled under (epibole) – "thickened—soft to firm and flexible to touch"[17]

It is important to distinguish between epithelial tissue and maceration

- Maceration presents as soggy white tissue around the edges of the wound due to excess moisture.

Epithelial Tissue vs. Maceration

Epithelial Tissue

Maceration

Pain

Assess pain level at wound site using the pain scale/rating according to policy

- At rest
- During palpation of surrounding skin
- During dressing changes

Wound Contamination versus Infection

Contamination

- "Open skin wounds or wounds healing by secondary intention all are colonized with microbial organisms"[22]

Infection

- "The presence of microorganisms with signs and symptoms of disease"[23]
- Determination of infection should be based on clinical signs and microbiological observations. Restrict cultures to clinically infected wounds or non-healing wounds (consider critical colonization)[24]

Contaminated, healing wound

Infected, nonhealing

Biofilm

Leg ulcer photo: Courtesy of Keith Cutting, Ealing Hospital NHS Trust, and Buckinghamshire Chilterns University College, London, United Kingdom. Tooth biofilm: ASM Biofilm Collection, Ruby & Gerencser.

Microbial Progression in Wounds

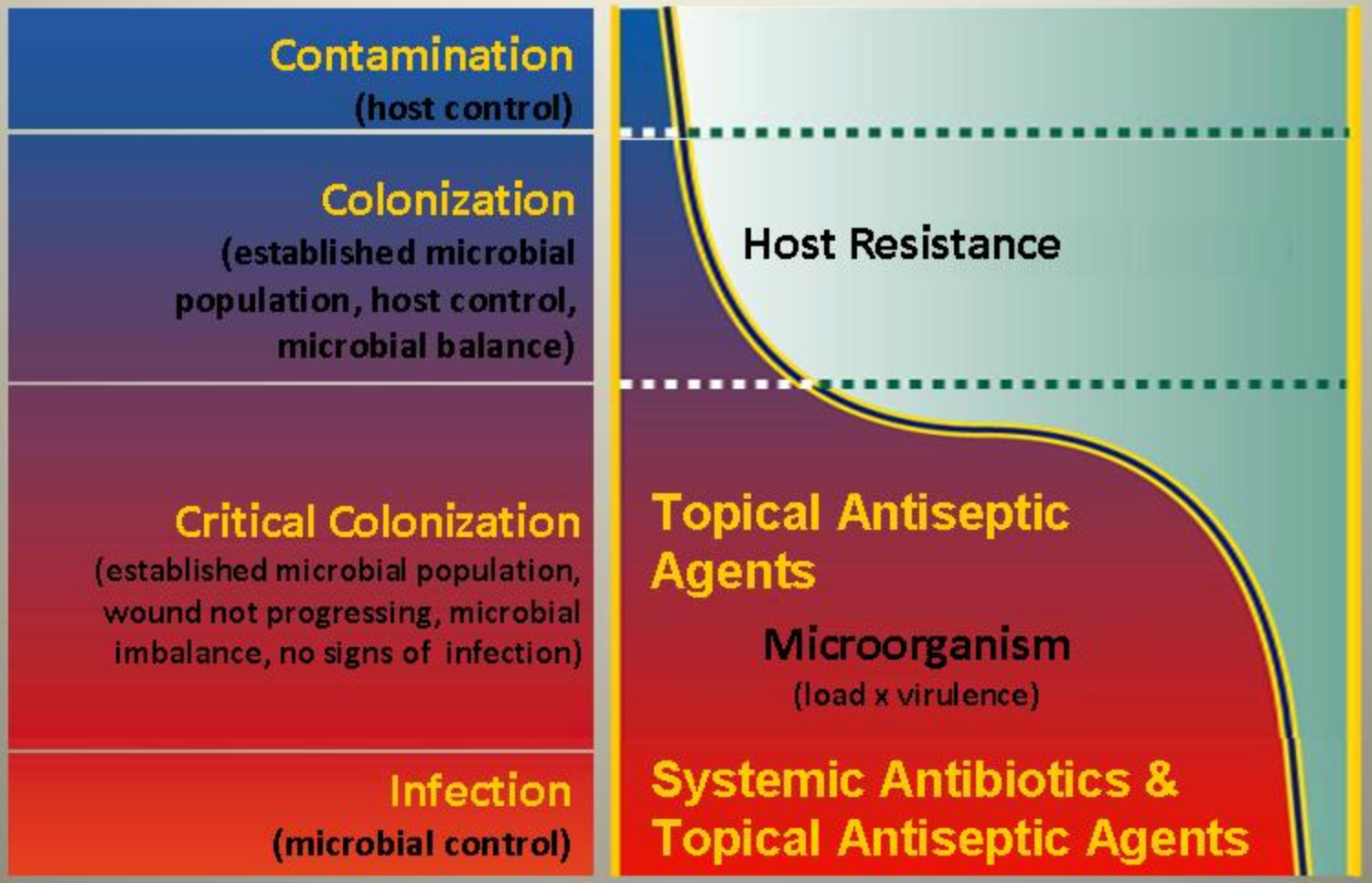
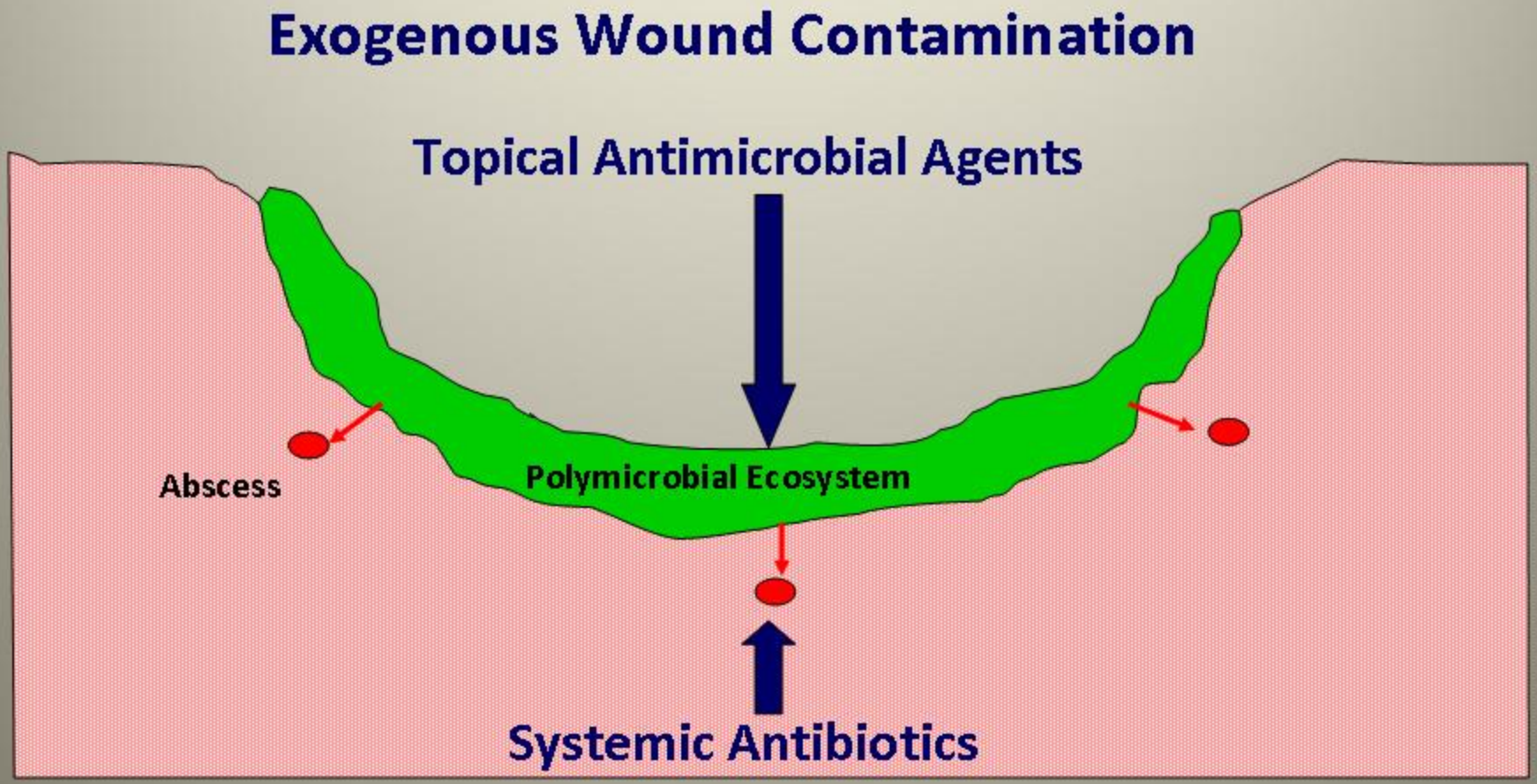


Figure used with permission.
Bowler PG. *Ostomy Wound Manage.* 2003;49:44-53.

The Desired Action of Topical Antimicrobial Agents



Adapted from Bowler PG. *Ostomy Wound Manage.* 2003;49:44-53.

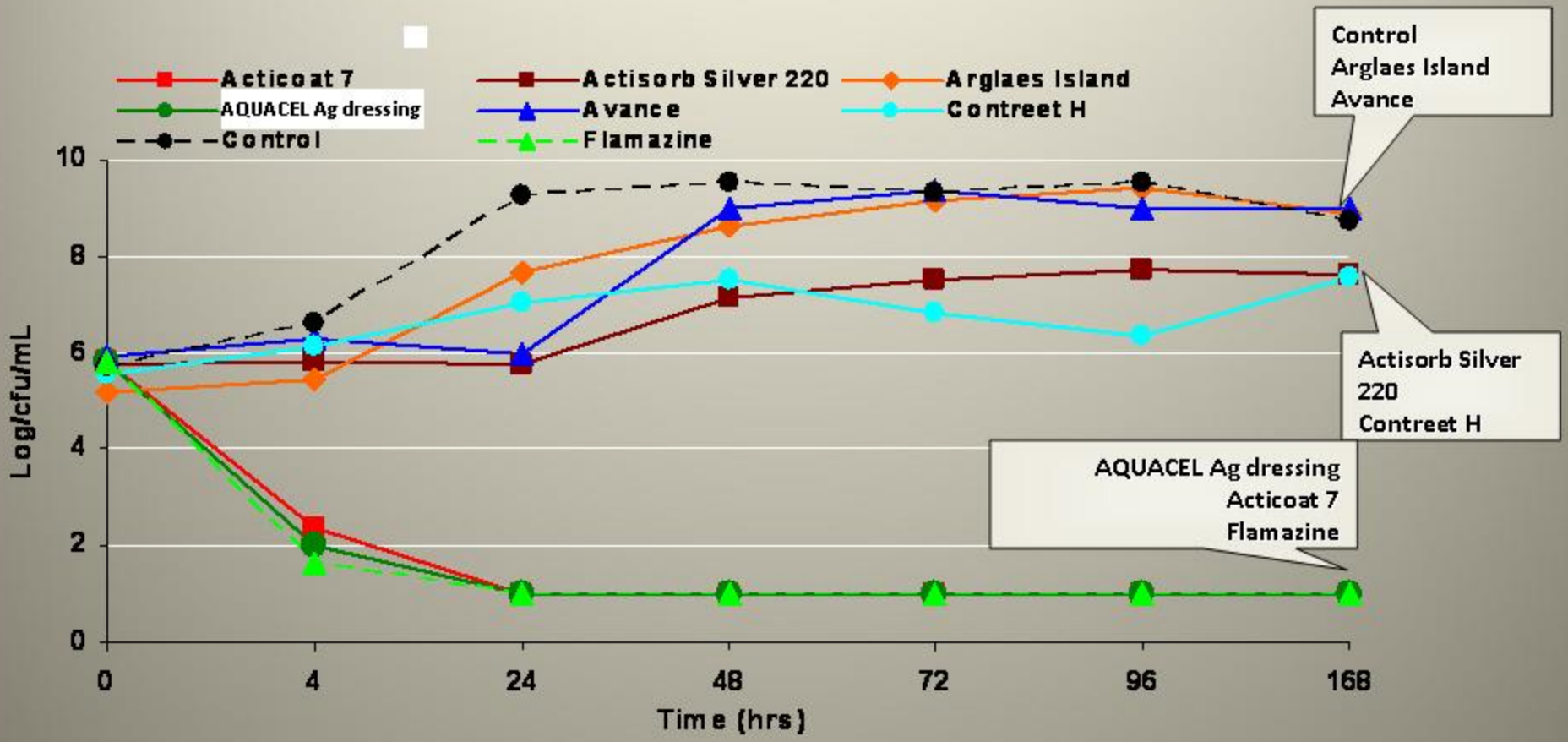
Why Ionic Silver?

- Ionic silver starts killing a broad spectrum of pathogens within 30 minutes of exposure to the dressing as demonstrated by in vitro testing, including MRSA and VRE[1]
- provides rapid and sustained antimicrobial activity[1,2,3].
- provides sustained antimicrobial activity for up to 7 days[2].
- is effective against *Pseudomonas aeruginosa* and *Staphylococcus aureus* over 7 days[2].

Silver sulfadiazine can result in:

- Development of a pseudoeschar[8]
- Inflammation[2]
- Maceration[7]
- Delayed re-epithelialization[2,7]
- Frequent reapplications[2,8,9]
- Gauze can adhere to wounds, causing pain and trauma to the wound bed upon removal[10]

In Vitro Antimicrobial Efficacy of Silver-Containing Dressings (*P aeruginosa*)



Adapted with permission.
Bowler PG. *Ostomy Wound Manage*. 2003;49(Suppl):2-5.

Antimicrobial Efficacy of Ionic Silver

- Silver is bacteriocidal in its ionic form[1]
- Ionic silver, which has antimicrobial activity, becomes available when in contact with moisture
- The silver ion is antimicrobial and active at low concentrations (oligodynamic)

1. Lansdown ABG. *J Wound Care*. 2002;11:125-130.

Changed to Hydrofiber with AG note staining on skin and need for fluid management

Dressing in study

- Hydrofiber® dressing Silver-containing Hydrofiber® dressing (SCHD,
- AQUACEL® Ag) containing ionic silver, was covered with
- adhesive Hydrocolloid cover dressing (DuoDERM®
- EXTRA THIN)
- Foam A dressing Adhesive foam dressing containing silver sulfadiazine
- Foam B dressing Non-adhesive foam dressing containing silver sulfadiazine
- Foam C dressing Silicone adhesive dressing foam containing silver sulphate

Examples of *S. aureus and P. aeruginosa growth beneath*

SCHD in the indented agar. Figures in brackets indicate percentage bacterial growth relative to total indented agar surface area for an individual replicate

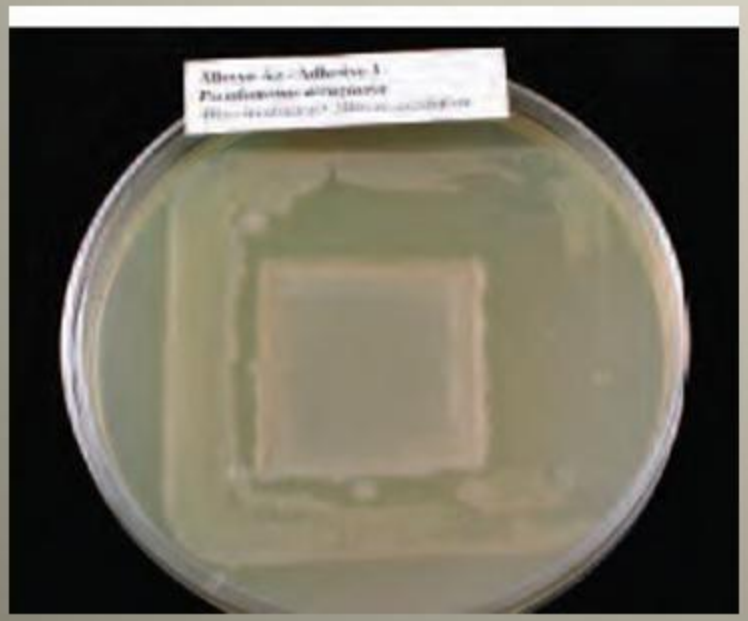
SCHD with *S. aureus* (0.0%) growth

SCHD with *P. aeruginosa* (3.6%) growth

Examples of *S. aureus and P. aeruginosa growth beneath* Foam A (Allevyn adhesive AG) dressing in the indented agar. Figures in brackets indicate percentage bacterial growth relative to total indented agar surface read for an individual replicate

Foam A with *S. aureus*

(21.0%) growth

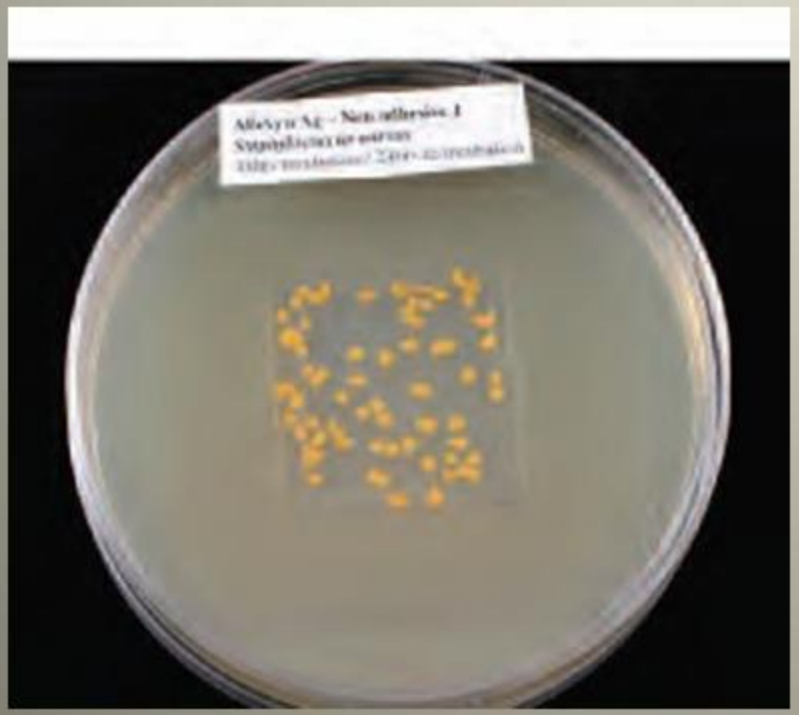


Foam A with *P. aeruginosa*

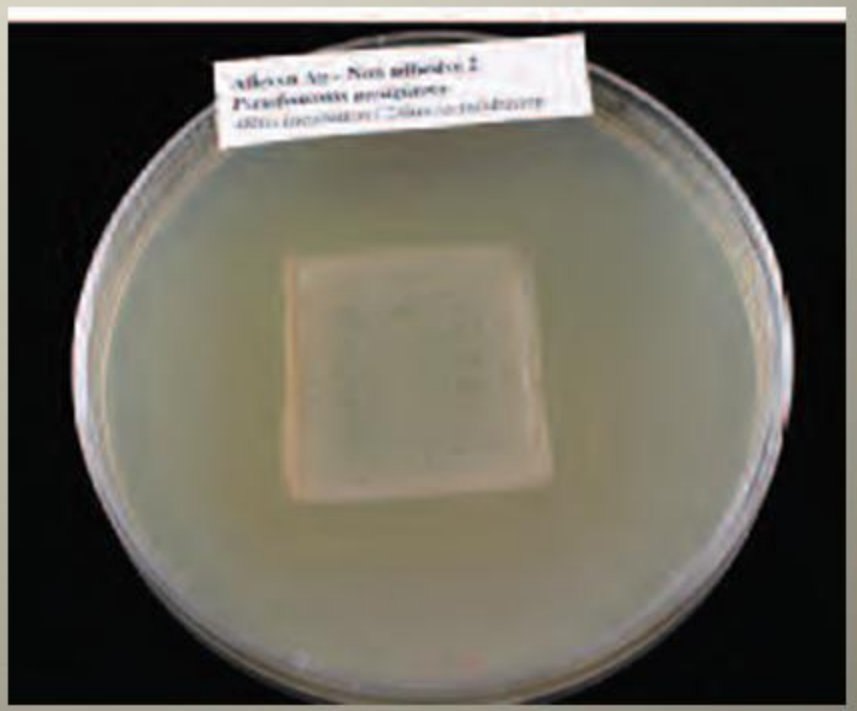
(100.0%) growth

Examples of *S. aureus and P. aeruginosa growth beneath* Foam B dressing (Allevyn AG border) in the indented agar. Figures in brackets indicate percentage bacterial growth relative to total indented agar surfacearea for an individual replicate

Foam B with *S. aureus* (17.3%) growth



Foam B with *P. aeruginosa* (97.9%) growth



Examples of *S. aureus and P. aeruginosa growth beneath* Foam C (Mepilex AG)in the indented agar. Figures in brackets indicate percentage bacterial growth relative to total indented agar surface area for an individual replicate

Foam C with *S. aureus* (73.0%) growth

Foam C with *P. aeruginosa* (100.0%) growth

In Conclusion after a 48 hour period

- Using an *in vitro tissue conformability model SCHD was observed to conform more closely to the tissue surface than the tested*
- silver-containing foam dressings following hydration.
- • There was no evidence of fluid accumulation at the tissue/dressing interface with SCHD, but this was observed with the tested
- silver-containing foam dressings.
- • Using an *in vitro shallow wound microbial model, it was observed that SCHD killed more bacteria (both P. aeruginosa and S. aureus)*
- beneath the dressing than any of the tested silver-containing foam dressings.
- • Additionally, SCHD was observed to not allow the spread of bacteria beyond the edge of the simulated wound

Pressure Ulcers

Wound Management Highlights – Infection

- "Manage wound infections and differentiate between contamination, colonization and infection."[13]
- Obtain quantitative culture or tissue biopsy of wounds which exhibit clinical signs of infection (ie, delayed wound healing).[13]
- Consider topical antimicrobials with high bioburden (>10^5). [13]
- "Use topical antibiotics in wounds cautiously and selectively"[13]
- "Use systemic antibiotics in the presence of bacteremia, sepsis, advancing cellulitis, or osteomyelitis"[13]
- Reduce the bacterial load in the pressure ulcer[5]

Pressure Ulcer Staging

Stage I

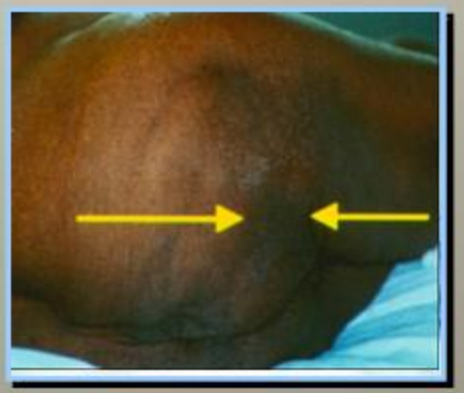
Stage II

Stage III

Stage IV

Unstageable

Suspected
Deep Tissue Injury



Suspected Deep Tissue Injury