



1

**ANTIMICROBIAL RESISTANCE IN
WOUND CARE: IT'S THE PITS**

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2

DISCLOSURE OF FINANCIAL RELATIONSHIPS

I have the following relevant relationship(s) to disclose in relationship to this presentation:

Catherine Milne


- Speakers Bureau: Solventum, Smith & Nephew, Convatec (Ostomy), Hartmann
- Co-chair WoundCon; Editor - WoundSource
- Board Member: Post-Acute Wound and Skin Integrity Council; President of Coalition for at-Risk Skin



3

Learning Objectives

Describe	Implement	Incorporate	Explain
Describe core principles of antimicrobial stewardship and apply them to practice	Implement evidence-based infection prevention strategies to enhance patient safety	Incorporate advanced wound technologies and techniques to optimize outcomes	Explain the role of biofilms in wound healing and identify methods to disrupt them



4


It's the PITS

P = Prevention


I = Intervention

T = Treatment

S = System/Setting



Cole W, Greenstein E, Herman I, et al. Antimicrobial resistance in wound care: expert panel consensus statements. *Wounds*. 2025;37(5 Suppl):S1-S24. doi:10.25270/wnds/25035




5

PITS - Prevention

- Optimize the patient
- Keep skin intact
 - Environmental
 - Skin Hygiene
 - Moisturization
 - Foot care
 - Moisture Management
 - Environmental Rounds
 - Hand Hygiene

Consensus

Effective wound management hinges on optimizing the local wound environment by improving blood flow, addressing underlying comorbidities, debriding necrotic tissue, maintaining appropriate moisture balance, off-loading pressure, reducing edema, and controlling bacterial load within the tissue. These strategies are fundamental to preventing the onset of infection.



Cole W, Greenstein E, Herman I, et al. Antimicrobial resistance in wound care: expert panel consensus statements. *Wounds* 2025;37(5 Suppl):S1-S24. doi:10.25270/wnds/25035

6

Microbiome

- A community of microorganisms living in a specific habitat.
- Skin habitats vary with different microbiomes in different areas.



7

Benefits of the Microbiome



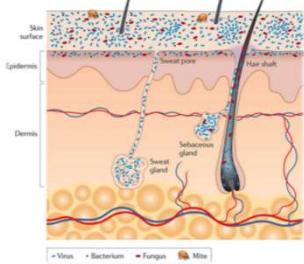
- Protect against pathogens
- "Instruct" T cells
 - Allows early recognition of similar pathogenic organisms
- Work Synergistically
- pH Modulation through fatty acid production in sebum
 - Acidic pH inhibits *Staphylococcus aureus* and *Streptococcus pyogenes*

Grice EA, Segre JA. The skin microbiome. Nat Rev Microbiol. 2011;9(4):244-253. doi:10.1038/nrmicro2537



8

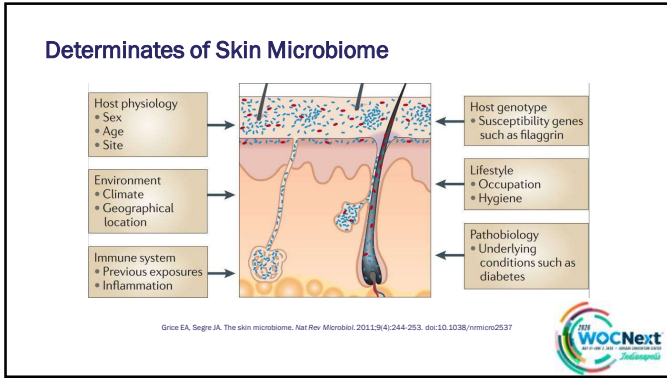
Skin Microbiome



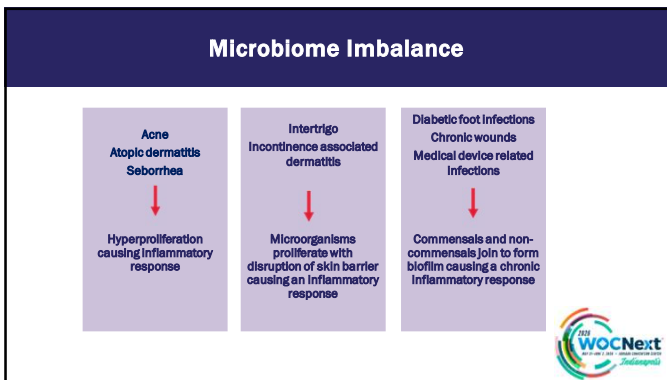
Grice EA, Segre JA. The skin microbiome. Nat Rev Microbiol. 2011;9(4):244-253. doi:10.1038/nrmicro2537



9



10



11

Patient/Caregiver Prevention Teaching


- Avoid use of topical antibiotics and those with ingredients with high sensitization
- Know Your ingredients
- Avoid smoking - impacts/depletes collagen
- Moisturize, Moisturize, Moisturize!
- Environmental review

12

PITS - Intervention

- Wound Hygiene
- Therapeutic Wound Cleansing
- Identify Infection


The consensus group recommends that clinicians perform therapeutic wound cleansing for all wounds, including the periwound and surrounding skin.



16

Wound Hygiene

- Developed by the International Wound Infection Institute
- Therapeutic Wound Cleansing (TWC), Debridement (and TWC AGAIN), pH control, targeted and thoughtful wound dressings and wound/periwound environmental control
- All wounds, all the time
- The Solution to Pollution is Dilution



Haesler E, Swanson T, Ousey K, et al. Establishing a consensus on wound infection definitions. J Wound Care. 2022;31(Sup12):S48-S59. doi:10.12968/jowc.2022.31.Sup12.S48

17

Don't Rely on Your Eyes



18

Wound Cleansing Solutions

Water

- Ineffective in reducing bacterial load
- Potential for contamination

Saline

- Ineffective in reducing bacterial load
- Once opened can serve as a medium for bacterial growth



Gabriel A, Schragi ED, Windle ML. Wound irrigation. Medscape 2013. <https://tinyurl.com/xgqj6m>; Stewart PS. Biophysics of biofilm infection. PathDev. 2014;7(2):122-218.

19



Clean the Wound and Wound Edge
Periwound 4 cm out
Skin Hygiene 20 cm from wound edge
Wound edge is important



International Wound Infection Institute (IWII) Therapeutic wound and skin cleansing: Clinical evidence and recommendations. Wounds International. 2025. Available at: https://woundsinternational.com/wp-content/uploads/2025/03/IWII_2025_Wound-cleansing-web-2.pdf

20

Table 2. Profiles of commonly used wound and skin cleansing solutions

Cleansing solution*	Properties	Concentration	pH	Therapeutic index**	Safety profile*	Mode of action
Acetic Acid	Antimicrobial	0.5-5% (0.5 conc. should be preferred)	2-4	No data	Cytotoxicity to human cells; Irritant for all concentrations above 0.5%; Allergic reactions rare**	• Primarily antimicrobial; • Antiseptic cleansing and astringent; • Antimicrobial synergistic mechanisms; • Probiotic processes**
Aluminum Salts	Antimicrobial	1% aluminum acetate or 0.5% aluminum chloride**	3-6.5	No data	May cause eye irritation; Not recommended for use on mucous membranes	• High acidity causes irritation on the wound; • Astringent properties; • Antimicrobial; • Drying on both sides; • Recommended for use on non-healing wounds
Betadine (Povidone-Iodine)	Surfactant (Betadine)	0.5%	6-8	Minimal toxicity; No data	Minimal cytotoxicity; Irritant for concentrations above 10%; Allergic reactions rare**	• Povidone-iodine releases iodine; • Iodine is antimicrobial; • Iodine is astringent; • Iodine is astringent; • Iodine is astringent

Note: Partial List – Please refer to IWII Document

Therapeutic Wound Cleansing Solutions



IWII Working Group. International Wound Infection Institute (IWII) Therapeutic wound and skin cleansing: Clinical evidence and recommendations. Wounds International. 2025. Available at: https://woundsinternational.com/wp-content/uploads/2025/03/IWII_2025_Wound-cleansing-web.pdf

21

Therapeutic Wound Cleansing Considerations

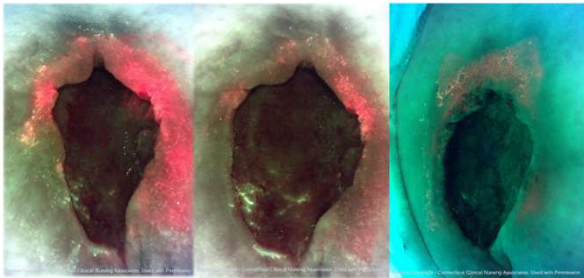
- Patient characteristics/goals of care
- Wound Type
- Cytotoxicity
- Allergies
- Amount and type of microorganisms
- Wound bed pH
- Product instructions for use
- Setting of TWC and availability of supplies



IWII Working Group, International Wound Infection Institute (IWII) Therapeutic wound and skin cleansing: Clinical evidence and recommendations. Wounds International.2025. Available at: https://woundsinternational.com/wp-content/uploads/2025/03/IWII_2025_Wound-cleansing-web.pdf



22



23

PITS – Treatment Considerations

Think Global – Act Local

- Culture to treat
- Modulate pH
- Antimicrobial dressings



24

PITS – System/Setting

Use the Three “E” Approach

- Education
 - Policies
 - Incorporate consensus and best-practice statements
- Engagement
 - C-suite
 - Staff and patient/family
 - Antimicrobial stewardship program with wound management as agenda topic
- Equipment
 - Available and appropriate use



28

Treatment Setting



29

Treatment Setting – Environmental Rounds



30

System – It Takes a Village - Not a Silo

- Assemble your Team – Clinical and Non-clinical
- Identify areas for improvement
 - SNF/STR – Culturing
 - PCP offices/Urgent Care/Community health centers
- Education vs. Competency
 - Teach-back method
 - Role modeling
 - Gaming/Competitions
- Reach out to others (students - nursing, therapy, medical students)
- Set expectations up front
- Write the order –have supplies available (it means working with purchasing/value analysis)

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31

Thank You!



32