Rethink Your Approach to Infection Control

From each protocol established in the operating room, to the ICU, to the daily administration of patient care on the in-patient wards, everything your acute care teams do is meant to set the stage for the best possible patient outcomes. Preventing infections by eliminating the bacteria in a patient's own skin flora has been one of the prevailing protocols designed to achieve this goal. But once you kill all the bugs on the skin, what happens next?

The skin is the largest organ system in the human body, making up roughly 16% of our body weight. When healthy, it performs a variety of defensive functions and plays a vital role in immune health. It's worth considering the role of topical antiseptic drugs in an acute setting—including bathing and surgical prep—and whether they interfere with the skin's defensive capabilities and actually inhibit healing, or whether they support the skin's defense system and stage the patient for better outcomes.

What Is a S.M.A.R.T. Approach to Staging Patients for Better Outcomes?

The state of a patient's skin is a major factor in patient outcomes:

S In an acute care setting, one of the biggest risks to patients is a hospital-acquired infection (HAI), and the skin's role in preventing infection is probably one of the most critical functions of the integumentary system. The stratum corneum limits the invasive growth of bacteria because of its acidic pH, resident microflora, and surface-deposited lipids.[1] *Optimizing the **s**tratum corneum* means maintaining a low-acidity environment where the skin's natural and diverse microbiota can flourish, and the epidermal lipids of keratinocyte origin can provide a barrier against transcutaneous water loss and microorganism invasion.[2]

M At least 50% of HAIs are attributable to the colonization and formation of bacteria into biofilms.[3] Biofilms form once a pathogen adheres to a surface—whether it is a medical device, the acute care environment, or the patient's own tissue—and begins to form an extracellular polymeric substance (EPS) matrix in which to colonize.[4] There are three major components to biofilm formation—the microbe or pathogen itself, the EPS matrix in which they thrive, and the adhesion process. The antibacterial and antiseptic approaches historically used in healthcare have aimed to eliminate the microbe altogether, but antimicrobial resistance has made this a challenging task as evidenced by the fact that 700,000 people still die annually from drug-resistant diseases.[5] A smarter approach to biofilms would be to ***m**inimize the microbial adhesion risks*.

A Antimicrobial peptides (AMPs) are primarily produced by keratinocytes, neutrophils, sebocytes or sweat glands[6] and represent a major component of the body's innate immune system. In humans, one AMP in particular, the cathelicidin LL-37, has been shown to have antimicrobial and anti-biofilm activity against

multiple Gram-positive and Gram-negative pathogens in addition to wound-healing effects.[7] Studies have shown that AMPs, including LL-37, are pH dependent and function optimally at a low pH.[8-9] It is important to *support **a**ntimicrobial peptides* because AMPs like LL-37 are responsible for shutting down the cellular communication and adhesion mechanisms that are key to biofilm formation.[7]

R Wounds naturally trigger the release of proteases, enzymes that aid in tissue repair during the inflammatory phase by helping to remove unwanted material and bacteria. In many chronic wounds, however, proteases often go unregulated, resulting in devastating tissue damage. Proteases are more active in alkaline conditions, and lowering pH to a more acidic environment may reduce their activity.[10] Using products that maintain a healthy acid mantle can help reduce the toxicity of these overactive enzymes and ***re**-establish healthy inflammatory responses.*

T Even a small change in pH of a wound may appreciably alter the supply of oxygen available to the tissues and impair the wound healing process. A lowering of pH by 0.6 units releases 50% more oxygen, and a shift of pH by 0.9 units causes a 5-fold increase in release of oxygen.[10] Supporting ***t**issue respiration* with a reduced or acidic skin surface is critical to wound healing.

Harness the Power of a Patient's Skin Defense System to Improve Patient Outcomes

Staging your patient for the best outcomes means ensuring the skin is supported before and after surgery, in the ICU, and in other acute bathing scenarios. Contact us to learn about a S.M.A.R.T. approach to patient staging with Theraworx Protect.

References:

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