



Defending Against the
Development of Pressure Injuries –
Defense

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Understanding Pressure Injury Formation



Forces applied to the skin as a result of contact with another surface

- **PRESSURE** – direct pressure over a bony prominence can result in capillary closure, tissue deformation, and ischemia (lack of blood flow)
- **FRICTION** – the mechanical rubbing of the skin against a surface, e.g., dressing, bed linen, etc.
- **SHEAR** – strain on underlying tissue due to parallel and perpendicular forces working against each other
- **MICROCLIMATE** – Defined in terms of the skin temperature and humidity at the interface between skin and the support surface or the dressing



Options for Defense Against the Causative Factors

- Skin care system
- Skin sealants and cyanoacrylates
- Silicone border foam dressings
- Thin foam dressings

Skin Care Review



STEPS OF A BASIC SKIN CARE SYSTEM

CLEANSE

MOISTURIZE

PROTECT

TREAT



Cleanse

- Bathing
 - pH balanced, lipid-based cleansers
 - Tepid, not hot water
 - Bathing systems & shampoo caps
- Skin Care
 - After each episode
- Avoid vigorous scrubbing



Moisturize

Maintain adequate moisture level

- Apply moisturizers
 - Lotions, creams, natural oils
- Environmental humidity
- Support TEWL (trans-epidermal water loss)
 - Dimethicone/silicones

Protect

- Products should be breathable and not occlude the pores
- Improve skin integrity with nutrients, amino acids, vitamins, antioxidants
- Protect with sealants, ointments, and creams

Barrier Products

- Used for protection and management
- Remains in contact with skin even after repeated chemical assaults
- Consider barriers for both prevention and treatment
- May contain several ingredients:
 - Zinc oxide
 - Dimethicone/Silicones
 - White petrolatum


Skin Sealants



Protection

- Adhesives
- Friction
- Moisture/Incontinence

Management

- Denuded/Macerated Skin
 - Healing Wounds
 - Peristomal/Peritubular Sites
 - Skin Tears
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Cyanoacrylate Liquid Skin Protectant

- Chemically bonds to epidermis/dermis
- Protects against friction, moisture, and adhesives
- Forms a flexible, breathable, protective layer over intact or partial thickness skin injury
- Contains no solvents or activators

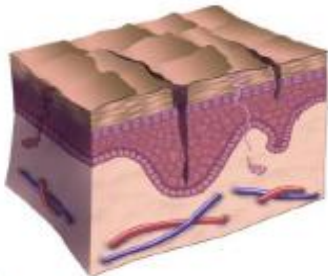
Microclimate

Temperature

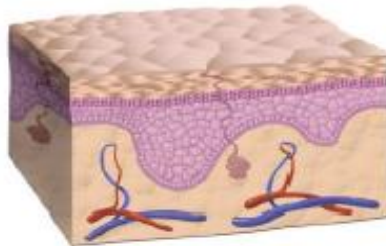
- Ideal temperature promotes optimal skin health
- Increase in temperature increases metabolic demand of skin, increasing the risk of more damage

Humidity

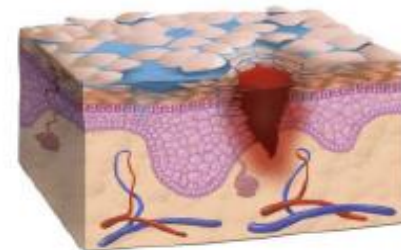
- Moisture affects barrier function of the skin
- Dry, cracked skin increases risk of breakdown and frictional forces
- Over-moist skin also increases risk of breakdown and frictional forces



Dry skin



Optimal



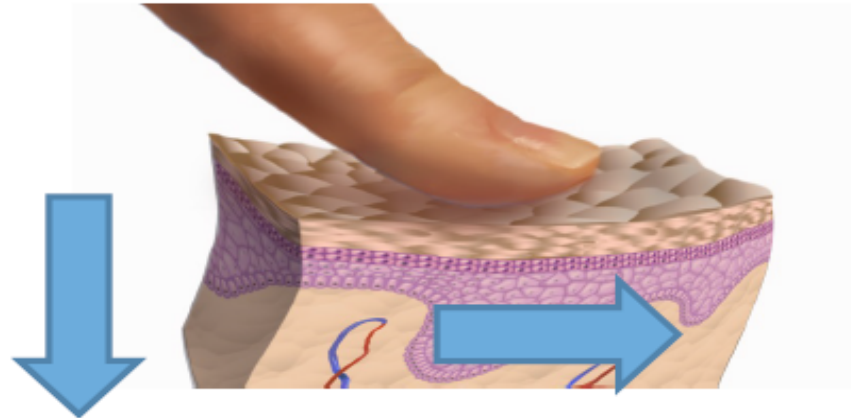
Wet skin

Friction

- Friction is both a static and dynamic force
 - **Static friction** – force needed to initiate movement
 - **Dynamic** – force needed to continue sliding or moving
- An increase in friction forces increases in the potential for shear
- An increase in moisture increases the risk of friction

Shear

- Shear force occurs only in the presence of friction.
- As friction increases, greater force is needed to cause sliding of the skin which creates more shear damage
- Shear forces can aggravate tissue damage already caused by other sources, like pressure



Preventing Against Shear & Friction

- Remember the presence of friction creates the possibility of shear.
- Silicone dressings minimize the coefficient of friction as the silicone border foam dressing slides across a surface, rather than the person's skin.
- If friction is reduced, then so is shear

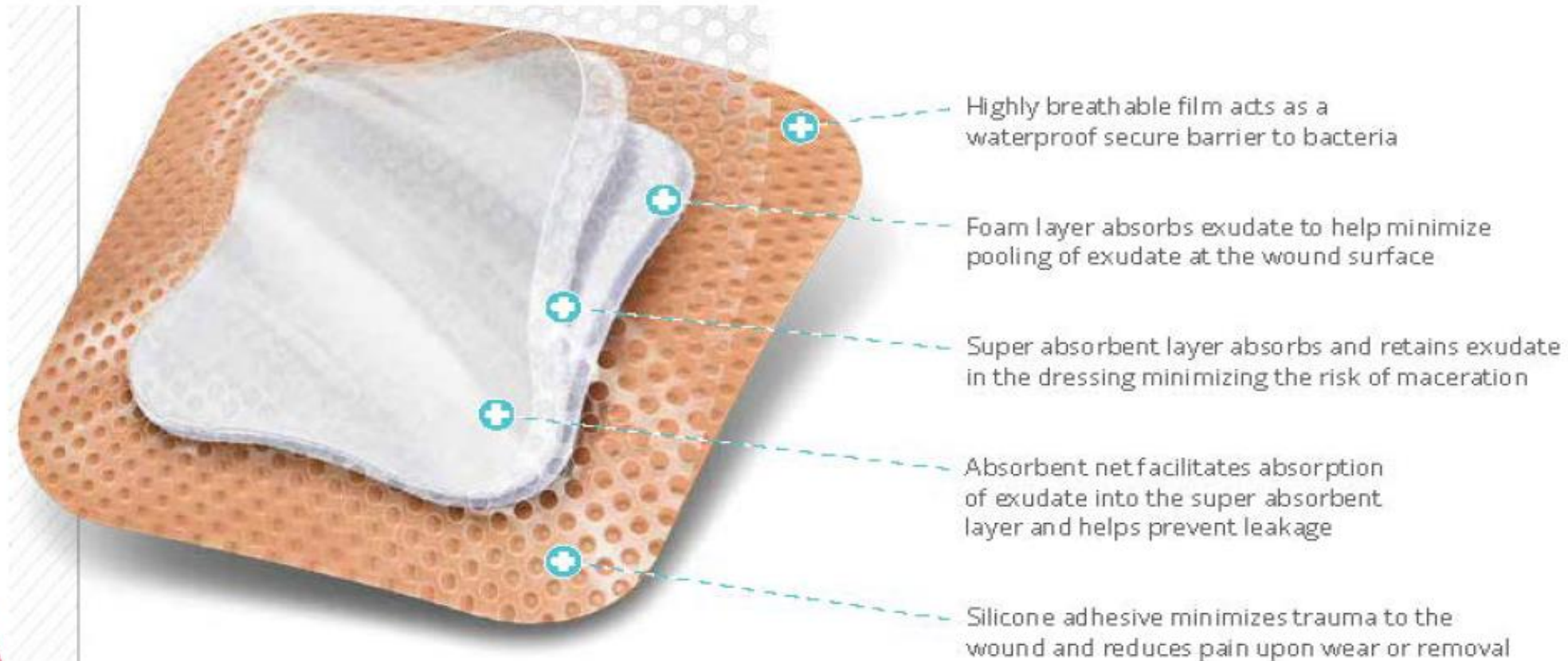


Silicone Foam Dressings – Managing the Microclimate

- Research shows that a Silicone border foam dressing is effective at preventing PI* based on its ability to handle:
 - Shear and friction
 - Temperature
 - Humidity
- Silicone border foam dressings help manage microclimate

*<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5016040/>

Five Layer Silicone Bordered Foam



Silicone Border Foam Dressings



Example: Silicone border foam dressings utilize silicone adhesive for gentle adhesion. The waterproof outer film reduces shear, friction, and addresses moisture such as perspiration, urine, feces, and wound drainage.

Medical Device Related Pressure Injuries (MDRPI)



Medical device related pressure injuries result from the use of devices designed and applied for diagnostic or therapeutic purposes. The resultant pressure injury generally conforms to the pattern or shape of the device. The injury should be staged using the staging system.

- Sequential compression devices/DVT sleeves/TED hose
- Face Masks
- Nasal cannulas
- Cervical collars
- Endotracheal tubes/ tube holders
- Pulse oximetry
- Splints and braces
- Urinary catheters
- Wrist bands



ET Tube

Mucosal Pressure Ulcer



Trach Ties

Unstageable



Retention Sutures

Stage III



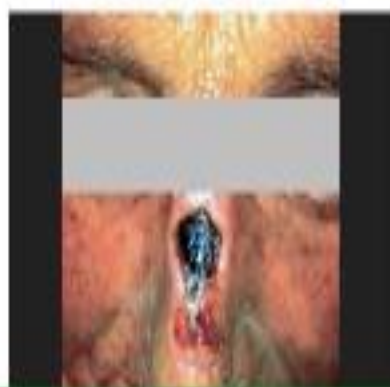
NG Tube

Unstageable



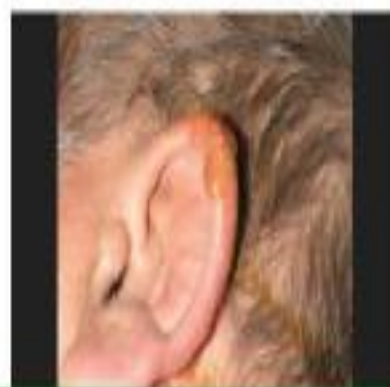
Oxygen Tubing

Stage II



CPAP Mask

Unstageable



O₂ Saturation Probe

Stage II



Arterial Line Tubing

Stage I

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Skin Health
Solutions

MDRPI



Gordian Medical, Inc. dba American Medical Technologies



Courtesy of Todd Brindle



<http://img.medscape.com/>



<http://img.medscape.com/>

MDRPI Prevention

- Assess skin prior to application
- Proper fit
- Proper application with avoidance of wrinkles and tubing in harms way
- Assess skin every shift and prn
- The use of a thin foam may help protect the skin

Thin Silicone Foam

- Ideal for cushioning under medical devices
- Thin and flexible
- Silicone for better adherence and gentle care
- Bordered: foam with silicone face and border and waterproof film
- Non-bordered: foam with silicone face and waterproof film backing, that can be cut to fit

