SKIN – PATHOPHYSIOLOGY

The skin is the largest organ of the body and, as such, comprises a surface area which is subject to external injury from mechanical forces (e.g. pressure, friction, shear, stripping), chemical exposure (e.g. fungi, bacteria). Provision of a barrier is one of the skin’s primary functions. Additionally, it prevents dehydration through evaporative water loss, maintains thermoregulation, synthesizes vitamin D and provides sensory feedback. Anatomically, the skin is composed of two layers: the epidermis and the dermis.

The **epidermis**, which is the outermost layer of the skin, is characterized as follows:

1) avascular

2) varies in thickness (depending on body location)

3) a dry structure which sheds cells and replaces itself every 4-6 weeks

4) approximately the thickness of a piece of plastic wrap

The **dermis** is located directly beneath the epidermis and is characterized as follows:

1) provides strength and structural support through a vascular network of connective tissues

2) contains blood vessels, nerves, hair, nails, sebaceous glands and sweat glands

3) is thicker than the epidermis

Below the dermis, is the **subcutaneous tissue** which is composed of major vessels, lymphatics, fat and connective tissue. This area provides insulation and nutritional support for the skin. Located below the subcutaneous tissue are fascia, muscles, tendons and bone. All layers of tissue below the epidermis are moist. Therefore, moisture retentive wound care treatments are usually indicated in order to maintain cell life and proliferation.
The skin changes as we age. The number of sweat glands declines and the epithelial and fatty layers of the subcutaneous tissue become thinner. As this padding is lost, a higher risk of skin breakdown secondary to pressure, friction, stripping and shearing exists. Itching and dry skin are also common complaints. Disease states, dehydration, malnutrition, medications and immobilization may further affect the skin and, when a wound is present, may impair healing.

Variations in skin color based on ethnic background can lead to a missed diagnosis of early compromise. Although the epidermal outer layer in black patients is the same thickness as that of lighter skinned individuals, there are a greater numbers of cells which are arranged in a more compact fashion. This results in a more effective barrier to chemical and mechanical insults. However, the dark pigmentation also makes assessment of early injury and treatment more difficult to detect. In black patients, an “ashy” appearance of the skin, warmth, tightness or firmness under the skin are signs of early compromise.

An in-depth discussion of the skin is beyond the scope of this material. However, knowledge of optimal conditions for healthy skin is important to understanding the rationale for prevention techniques.
COMMON SKIN PROBLEMS

1. **Folliculitis**  
   Bacterial infection pustule may be superficial/deep; may develop into Boils or carbuncle. Common cause: staph aureus moves in on damaged follicle and colonizes. Responds well to treatment.

2. **Sensitization**  
   Sensitive to adhesive tapes, skin barriers, sealants, pouches, clamps, powders, and cements. Skin ma appear erythematous, edematorus, weeping, eroded, or bleeding. Symptoms may include itching, stinging, and burning sensations. Diagnosis confirmed by patch testing.

3. **Chemical Burns**  
   Caused by stool, urine, glues, solvents, soaps, and detergents. Inappropriate equipment most common factor.

4. **Mechanical Trauma**  
   Cornified layers of skin traumatized by pressure, friction, shearing, stripping, or material from the skin. Characterized by erythema, weeping, bleeding, or burned appearance. Usually painful.

5. **Keratinization**  
   Cytoplasm develops strands of fibrous water proof protein called keratin.

6. **Candia/ Yeast**  
   Fungal rash, *monilia, irregular erythematous mass with red or white popular and satellite lesions, *urticaria. Diagnosis: tissue scrape culture.  
   Treatment: K&M; Microguard (Sween)

7. **Mucosal Cutaneous Separation**  
   May cause subsequent complications: retraction, stenosis, prolapse, and peritonitis until closure of the fascia occurs.

8. **Radiation Dermatitis**  
   Caused by skin cell destruction and mechanical stripping of the epidermis when skin barriers and adhesives are removed. There may be erythema, edema, ulceration, weeping, bleeding vesicles.  
   Treatment: wash with water ony, DomeBoro solution, Perry Model 51, or nonadhesive system.

9. **Scar Tissue**  
   More fibrous, less elastic and non-pliable, lacks sweat glands and sebaceous glands that secrete substances to protect skin from moisture and irritants; has little or no sensation. Adhesive adheres poorly. May be responsible for retraction of the stoma or scar tissue formation around the stoma; shrinkage of the fascia; supportive structures pull the stoma inward.

10. **Peristomal Hernia**  
    Caused by weak abdominal muscles or inadequate surgical securing of supportive structures.