SKIN AND WOUND CARE CONSIDERATIONS IN NON-CAUCASIAN SKIN

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Objectives

- Understand the basic physiology responsible for skin pigmentation
- Recognize normal dermatological variations in black skin
- Describe the appropriate methods to perform thorough skin/wound assessment in non-Caucasian skin
- Recognize the signs and symptoms of skin breakdown or pathology in non-Caucasian skin
A&P Review of the Skin

- Skin is the largest organ of the body
  - In a 150-pound person, the skin is comprised of 18 square feet and weighs about 12 pounds.
  - The skin has three functional layers
    - Epidermis
    - Dermis
    - Hypodermis or subcutaneous layer

A&P: Layers of the Skin

- **Epidermis**
  - Five layers of cells (superficial to deep)
    - **Functional components:**
      - Made up of tough, flattened cells of the protein keratin
      - Cells provide barrier to injury, contaminants, light, retain water
      - Keratinocytes secrete protein keratin
      - Melanocytes produce melanin (pigment)
      - Basal and prickle cells regenerate epidermis, produce Vit. D
      - Langerhans cells are a component of the immune system

Epidermis: Stratum Corneum

- **Protective layer**
  - Highlighted in green
- **Outermost layer with cells that are desquamated and turn over every 30 days**
- **Comprised of 15-20 layers of non-nucleated keratinized cells**
Epidermis: Stratum Lucidum
- Transparent layer found mainly in the soles and palms (i.e. thick epidermis)
- Transitional layer that is 1-5 layers thick

Epidermis: Stratum Granulosum
- Granular layer that is 1-5 cells thick
- Forms a waterproof barrier that functions to prevent fluid loss
- Synthesizes keratohyaline which is the precursor to keratin

Epidermis: Stratum Spinosum
- This is the prickle cell layer
- This layer contains desmosomes which terminate in spiny projections which hold the cells together and help protect the skin from abrasion
- Langerhan’s cells also provide antigens to T-lymphocytes (immune response)
Epidermis: Stratum Germinativum
- Single cell layer
- Provides germinal cells necessary for the regeneration of the epidermis
- Contains melanocytes which are responsible for the pigment of the skin

Basement Membrane
- The epidermal-dermal junction- where cells reside that are responsible for mitotic growth and epidermal regeneration
  - occurs approximately every 30 days
- Fibronectin is the major protein in the basement membrane
  - It is an adhesive glycoprotein (the glue that holds it together)
- Layers are lamina lucida and lamina densa
- Rete pegs (epidermal) attach with the dermal papillae to support the epithelium and dermis

Layers of the Skin
- The epidermis has an irregular shape, resembling downward, finger-like projections called rete ridges or rete pegs (see next slide).
  - The significance of this anatomical structure is that the dermis has upward projections.
  - The upward and downward projections fit together, very much like a waffle iron. These protuberances connect, anchoring the epidermis to the dermis.
  - This bond also helps to prevent the epidermis from sliding back and forth across the dermis with normal movement and skin manipulation.
  - In healthy young skin, the 2 layers of skin move as one. This is not the case in elderly skin (skins over the age of 60)
  - This is why shear and friction can cause skin tears in the elderly.
Layers of the Skin

Note the dark pink fingerlike projections. These are the rete pegs.

Dermis
- Two layers of irregular connective tissue
  - Papillary layer: anchors dermis to epidermis
  - Reticular layer: contains dense, deep accessory organs
- Functional components of the dermis:
  - Hair follicles
  - Nerve endings (pain, heat, cold, touch, pressure)
  - Lymph vessels (remove excess fluid, store protein)
  - Capillaries (supply nutrients and O₂, remove water and waste)
  - Collagen (bulk, strength, support)
  - Elastin and reticulin (extensibility, integrity)
  - Sweat glands
  - Sebaceous glands (sebum, controls pH, antibacterial and antifungal effects)

Subcutaneous tissue
- Functional components:
  - Adipose or fat
  - Connective and elastic tissue
  - Insulate, support, cushion and store energy
Functions of the Skin

- Dynamic organ continuously engaged in biological and biochemical activity
- Protection
- Temperature regulation
- Fat and water storage
- Vitamin D synthesis
- Excretion of waste
- Cosmetics
- Touch/sensation

Trauma and damage to the skin can lead to functional impairments

Stats and Information

- 80% of the world’s population consists of individuals with pigmented skin
  - Skin pigmentation continuum: light ivory, deep brown, black, yellow to olive, light pink to dark, ruddy pink, and red

- The population of the US is ~ 28% non-Caucasian
  - By 2050, it is projected 48% of the US population will be non-Caucasian
  - Ethnic skin is defined as non-Caucasian darker skin types (Fitzpatrick IV, V, VI phototypes)
    - Asians, Africans, Afro-Caribbeans, African Americans, Aborigines, Native Americans, and Hispanics
    - General categories (not all inclusive)

Fitzpatrick’s Skin Phototypes

<table>
<thead>
<tr>
<th>Phototype</th>
<th>Sunburn &amp; Tanning Hx</th>
<th>Immediate Pigmentation Darkening</th>
<th>Delayed Tanning</th>
<th>Constitutive Color</th>
<th>UV-A MED (mJ/cm²)</th>
<th>UV-B MED (mJ/cm²)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>Burns easily</td>
<td>None</td>
<td>None</td>
<td>Ivory White</td>
<td>20-35</td>
<td>15-30</td>
</tr>
<tr>
<td>II</td>
<td>Burns easily</td>
<td>Weak</td>
<td>Min to weak</td>
<td>White</td>
<td>30-45</td>
<td>25-40</td>
</tr>
<tr>
<td>III</td>
<td>Burns medium</td>
<td>Definite</td>
<td>Low</td>
<td>White</td>
<td>40-55</td>
<td>30-50</td>
</tr>
<tr>
<td>IV</td>
<td>Rarely burns</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Beige-Olive, lightly tanned</td>
<td>50-80</td>
<td>40-60</td>
</tr>
<tr>
<td>V</td>
<td>Rarely burns</td>
<td>Moderate</td>
<td>Strong, intense brown</td>
<td>Dark brown or black</td>
<td>70-100</td>
<td>60-90</td>
</tr>
<tr>
<td>VI</td>
<td>Rarely burns</td>
<td>Moderate</td>
<td>Strong, intense brown</td>
<td>Dark brown or black</td>
<td>150</td>
<td>90-100</td>
</tr>
</tbody>
</table>
Pigmentation

- Normal skin color or tone is composed of four biochromes:
  - Melanin (brown)
  - Carotenoids (yellow; exogenous from diet; found in subcutaneous tissue)
  - Oxyhemoglobin (red; concentration and state of oxygenation of hemoglobin)
  - Reduced hemoglobin (blue; presence of other pigments)
- The total amount of melanin is the principal determinant of skin color
- Constitutive skin color designates a genetically determined level of cutaneous melanin in the absence of exogenous or endogenous influences
- Faculative skin color designates an induced level of increased epidermal melanin content due to solar radiation, hormones, and other environmental factors (Pathak 1985)

The cutaneous pigment melanin is produced by melanocytes

- Studies of human skin revealed no significant differences in the actual number of melanocytes (Szabo 1969)
- Racial differences in skin color are attributed to differences in the rate at which melanosomes are produced and melanized in melanocytes and then transferred, distributed, and degraded in keratinocytes

The biosynthesis of melanin occurs within the metabolic unit of the melanocyte, the melanosome

- The melanocyte, an exocrine cell, resides in the basal layer (or stratum germinativum) of the epidermis and in the matrix portion of the hair bulb
**Why Is This Important?**

- The problem for clinicians when assessing patients with pigmented skin is the lack of guidance and/or evidence.
- Understanding racial differences in skin function is essential for skin care, prevention and treatment of skin diseases and injuries.
  - Outside of the color spectrum, there are very few differences within the integumentary system across ethnicities.

**Main Structural Differences in Stratum Corneum Barrier Function (blacks vs. whites)**

- Equal thickness
- Increased number of cell layers (cohesion) and increased resistance to stripping
- Increased recovery after stripping
- Increased lipid content
- Increased electrical resistance
- Increased desquamation
- Equal corneocyte size
- Decreased amount of ceramides
Assessment Basics

- Visual inspection of the skin is not sufficient by itself; must use all senses
  - Look, listen (to the patient/family), touch and smell
- To accurately detect skin changes in patients, visual assessment must be followed by a thorough physical assessment of the wound/problem area and its surrounding skin
  - **Minimal skin assessment:**
    - Color, temperature, moisture, turgor, presence of intact skin or open areas
  - **Minimal wound assessment:**
    - Thorough patient exam, etiology or wound type, wound characteristics
      - Location, size, depth, exudate, and tissue type

Skin Assessment Components

**DERMATOLOGICAL**

- Describe integrity
- Edema
- Review sensory status
- Moisture
- Atrophic changes
- Turgor/texture
- Observe nail composition/hair quality
- Look/feel color and temperature variations
- Observe skin folds
- Geriatric dermatological changes
- Inquire about allergies and previous medical history
- Callus
- Assess vascular status
- Lesions (rashes, scars, bruising, hemosideran, necrotic, etc.)
Skin Assessment Components

D: describe integrity
- Skin is intact or presents with injury
- Classify type of skin injury
- Describe type, shape, arrangement, distribution of injury/lesions

E: edema
- Location
- Pitting vs. non-pitting
  - 1+ = Edema that is barely detectable
  - 2+ = A slight indentation is visible when the skin is depressed
  - 3+ = A deeper fingerprint returns to normal in 5 to 30 seconds
  - 4+ = The extremity may be 1.5 to 2 times normal size

R: review sensory status
- Intact or altered
- Location
- LOPS (loss of protective sensation), two-point discrimination, heat/cold, deep pressure, pin prick

M: moisture
- Dry or moist to touch
  - Dry: flaking, scales, fissures, cracks (hyperkeratosis, xerosis, eczema, dermatitis, psoriasis, rashes)
  - Moist: sweat, incontinence, weeping edema, wound exudate

A: atrophic changes
- Shiny, hairless extremities
- Recommend vascular consult

T: turgor/texture
- To assess, tent the skin on the back of hand
  - Normal
    - Quickly returns to original state
  - Slow
    - Diminished return to original state (dehydration, effect of aging)

O: observe nail composition and hair quality
- Nails (can reflect the patient's overall health)
  - Color, shape, contour, clubbing, texture, thickness
- Hair
  - Hirsutism: excessive body hair
  - Alopecia: hair loss

L: look and feel for color and temperature variations
- Normally smooth, slightly moist, and relatively same tone throughout
- Tone depends on patient’s melanocytes (skin pigmentation continuum: light ivory, deep brown, black, yellow to olive, light pink to dark reddish pink, or red)
- Pigmentation
  - Palms: mucosa, conjunctiva, distal extremities
  - Cyanosis: oral mucosa, conjunctiva, nail beds
  - Jaundice: sclera, palms, soles
  - Hyper- or hypopigmentation: may reflect variations in melanin deposits or blood flow
Skin Assessment Components

- **O**: observe skin folds
  - Look for breakdown, yeast/fungal infections, foreign objects
- **G**: gerontodermatological changes
  - Normal skin changes with aging
  - Risks: skin tears, bruising, senile purpura, pressure ulcers
- **I**: inquire about allergies and past medical history
  - Are findings exogenous or endogenous in nature
- **C**: callus
  - Indicates area(s) of high pressure or repetitive stress/trauma

- **A**: assess vascular status
  - Look, listen, touch
    - Color changes
    - Doppler
    - Palpate pulses, capillary refill, ABI (ankle brachial index)
- **L**: lesions (rashes, acne, bruising, hemosideran, nevi, etc.)
  - Document location(s), describe presentation, formulate working clinical diagnosis
  - Denote anything unusual or suspicious, and what may be a normal dermatological variant for the individual

Normal Variations in Black Skin

- **Futcher’s (Veigt’s) line**
  - Sharp demarcation between darkly pigmented and lightly pigmented skin in the upper extremity
  - Follows spinal nerve distribution
- **Midline hypopigmentation**
  - Line of hypopigmentation over the sternum
  - Lessens with age
- **Nail pigmentation**
  - Diffused pigmentation or linear dark bands on the nail
    - May appear brown, blue, or blue-black
- **Oral pigmentation**
  - Oral mucosa appears bluish-grey
  - Gingivae may also be affected
- **Palmar changes**
  - Creases may be hyperpigmented
    - May contain hyperkeratotic papules or pits in the creases
- **Plantar changes**
  - Hyperpigmented macules may vary in color and distribution
    - May present with irregular borders

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Normal Variations in Black Skin

**Futcher's or Voigt's Line:**
- Sharp, bilateral, pigmentary demarcation lines usually on the extremities
- Correspond to underlying spinal nerves innervating a dermatome
- An incidence of 25% reported in heavily pigmented black persons
- James found 73% of black females had at least one type of line
- Benign condition

**Midline Hypopigmentation:**
- Linear band overlying the sternum
- Unknown etiology; may be inherited in an autosomal dominant pattern
- Incidence approximately 30-40% in black persons
- Black males primarily affected, becomes less noticeable with age

**Nail Pigmentation:**
- Linear hyperpigmented nail streaks represent a normal variant in over 50% of black people
- Melanin is deposited in nail plate/matrix possibly due to trauma or UV light
- Positive correlation with advancing age
- Thumb and index nails most commonly involved
- Often bilaterally distributed
- Drugs such as antimalarials, doxycycline, and azithromycin may cause nail pigmentation
- Associated with systemic diseases such as Addison’s and Peutz-Jegher’s
- An irregular nail pigment or history of changing lesion warrants biopsy as 20% of melanomas in black people are found in the nails
Normal Variations in Black Skin

Gingival Hyperpigmentation:
- Symmetrical discoloration usually of anterior gingiva
- Certain drugs (antimalarials, phenothiazine) and heavy metals can cause oral pigmentation
- Addison's disease, Peutz Jegher's syndrome and hemochromatosis should also be considered
- Benign condition

Palmoplantar Hyperpigmentation:
- Due to localized hypermelanosis
- Polymorphous brown macules with sharp or indistinct borders
- Creases on the palms often present with hyperpigmentation and may contain hyperkeratotic papules or pits

Idiopathic Guttae Hypomelanosis:
- AKA Disseminate Lenticular Leucoderma
- Involves small, white, irregularly shaped macules primarily on the anterior lower extremities
- Unknown etiology; benign
- Macules range in size from 2-6 mm
- More common in women over the age of 40
- Histologically, there is a decrease in the number of melanocytes
Pigmentary skin disorders can cause emotional distress and social stigma. Disorders are the result of altered melanin production. Most common pigmentary disorders are albinism, vitiligo, melasma, ephelis (freckles), and lentigo (liver spots).

Vitiligo
- Vitiligo is a pigmentary problem that appears in all races and affects up to 1% of the general population.
- The lesion is a macular depigmentation (loss of melanocytes) with distinct borders on the face, neck, forearms, and hands.
- The etiology is unknown, although it appears to be inherited.
- It has also been found to be more prevalent in people with thyroid disease, pernicious anemia, and diabetes mellitus.
- Vitiligo is a chronic disease with a highly variable course.

Melasma
- Melasma is an acquired light or brown hyperpigmentation that presents most frequently on the face.
- It is commonly associated with exposure to sunlight, pregnancy, or ingestion of oral contraceptive hormones. A significant cause is idiopathic.
- Melasma may disappear spontaneously with resolution of the contraceptive or childbirth, but it may return with subsequent pregnancies.
- Because sun exposure can exacerbate the condition, patients should use sunblock or sunscreen.

How Does This Impact Wound Management?
- Thorough history and physical exam should reveal normal/abnormal dermatological conditions.
- Early detection of skin lesions is a top priority.
- This can be problematic in darker pigmented individuals.
- Erythema and/or blanching are not reliable indicators.
How Does This Impact Wound Management?

- **Must use all your senses…**
  - **LOOK**
    - What is normal for the individual?
    - Compare area to surrounding skin or contralateral side if applicable
    - Is the area in question a site of previous injury/scar?
  - **LISTEN**
    - Is the individual complaining of pain, itching or other sensory changes?
  - **TOUCH**
    - Is the area warmer/cooler?
    - Is the area firm/boggy?

Assessment Considerations

- **Inflammation**: normal response to tissue injury or insult and integral to microbial resistance
  - Triggered by endogenous and exogenous mediators which results in localized vasodilation and increased blood flow to area
  - Signs of inflammation:
    - Erythema, heat, edema and pain

- **Changes in skin color and temperature are due to the inflammatory process**
  - Failure to detect/observe may increase the risk of a patient developing a PrU or wound infection

Assessment Considerations

- **Erythema**: change in usual skin color due to dilation of superficial capillaries
  - Mediated by polymorphonuclear leukocytes, monocytes and macrophages
  - Occurs from time of insult to 2-5 days post injury
  - Color is a proven indicator of a physiological response to injury and a good indicator of a Stage I PrU
  - In non-Caucasian skin, erythema is difficult to detect
    - Light pigmentation → erythema is bright or dark red
    - Dark pigmentation → erythema presents as a darkening of patients natural skin tone
  - Caregivers who are not of the same ethnic background as patients may be less sensitive to slight changes in skin color
  - Use of a pen light can assist with skin color change observations
Assessment Considerations

**Palpation** is useful to assess skin temperature, edema and turgor of suspected damaged areas.

- **Skin Temperature** - usually warm to the touch
  - Warmer than usual could be sign of inflammation, and/or indicator of infection or pressure damage
  - Pale and cool skin may be sign of poor perfusion or ischemia and may indicate the end stage of non-blanching erythema
  - An increase or decrease in skin temperature is usually detectable by touch (palpation)

- **Edema** - one of the physiological signs of inflammation; also indicative of heart, liver and kidney failure, and venous insufficiency
  - Shiny, taut skin or pitting impressions in the skin adjacent to any wound but within 4 cm of the wound margin indicates edema
    - With finger, press firmly within 4 cm of wound margin, wait 5 seconds, observe for any indentation
  - Edema and induration occur because pressure causes separation in the skin layers and allows interstitial fluid to accumulate
  - Both are good indicators of tissue damage
Assessment Considerations

- **Turgor**: should quickly return to its original state
  - Slow return may indicate dehydration or effects of aging
  - Soft tissues may indicate underlying infection
  - Tense tissues may indicate lymphedema and/or cellulitis

Guidelines for Identifying Stage I PrU

- **NPUAP** - National Pressure Ulcer Advisory Panel
  - “Intact skin with non-blanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching, its color may differ from the surrounding area. The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue. May be difficult to detect in individuals with dark skin tones. May indicate “at risk” persons (a heralding sign of risk).”

Guidelines for Identifying Stage I PrU

- **EPUAP** - European Pressure Ulcer Advisory Panel
  - “Non-blanchable erythema of intact skin. Discoloration of the skin, warmth, edema, induration or hardness may also be used as indicators, particularly on individuals with darker skin.”
Guidelines for Identifying Stage 1 PrU

- **NICE**: National Institute for Clinical Excellence

  "Healthcare professionals should be aware of the following signs which may indicate incipient pressure ulcer development... in those with darkly pigmented skin: purplish, bluish, localized areas of skin; localized heat which is tissue becomes damaged (this is true regarding inflammatory changes in the skin) is replaced by coolness, localized edema and localized induration."

Blanch Test

- When gentle pressure is exerted on the skin, blood is temporarily forced out of the area, causing skin to appear white instead of pink
  - Blanch test differentiates healthy skin from damaged skin that is non-blanching erythema
  - In darkly pigmented skin the presence of melanin will ensure that the clinician will be unable to see the evacuation of blood, followed by the refill; only the melanin will be visible (Mattas 2001)
- A more accurate way to detect non-blanching erythema is to use clear glass or a plastic disc to assess whether discoloration blanches or not (Halfens 2001)

Basic Skin Care Considerations

- Wash and clean skin with an emollient antibacterial soap and warm water
- Pat dry all skin surfaces including between the toes and under skin folds
- Apply moisturizers after bathing or showering to remoisturize and lubricate the skin
- Maintain appropriate hair and nail care
Black skin can sometimes appear ashy when it becomes dry. Ashiness describes the slate-gray appearance that the scales of the stratum corneum impart to skin when superimposed on dark-colored skin. Common practice to use petrolatum and other heavy oils and greasy substances to abolish it (lanolin, vegetable oils, waxes). This can lead to acne (cosmetica/pomade acne). Recommended to use products that contain squalane (Montagna et al, 1993).

Use a lift sheet to move and turn patients. Do not drag patients. Use transfer techniques that prevent friction or shear. Pad bedrails, wheelchair arms, and leg supports. Support dangling arms and legs with pillows or blankets. Teach family members appropriate handling techniques.

Use air mattress and wheelchair geri-chair cushions. Use pillows to assist with positioning and pressure redistribution. Do NOT use donut shaped devices. Head of bed should not be higher than 30°. Unless indicated by physician. Side lying position should be 30°. Not directly on greater trochanter. Support with pillows. Watch for catheter lines, IV lines, and foreign objects in bed. Potential sources of pressure. Off Load heels so they do not touch the bed. Free floating concept.
Differential Diagnosis and Photo Gallery

Differential Diagnosis...
What could this be?
1. Bruise
2. Deep tissue injury
3. Mongolian spot
4. Tattoo ink

Differential Diagnosis...
What is this?
1. Closed PrU
2. Hypopigmented skin
3. Acute burn
4. Erythema
Clinical Presentation Comparison

Unstageable yet probable Stage III or Stage IV sacral pressure ulcer in dark skin (left) and light skin (right). Note the difference in the appearance of the periwound (area within 4 cm of the wound margin).

Post-Inflammatory Hyper/Hypopigmentation

- Black skin may respond to trauma or inflammatory disease by either an increase or decrease in pigmentation (dyschromia).
- Many of these pigmentary alterations normalize over time.
  - When a wound resurfaces it is closed. It is only truly healed when the maturation phase is complete and scar tissue is mature.
  - This can take up to two or more years in some individuals.
    - Immature scar: red, raised, rigid
    - Mature scar: pale, planar, pliable

Clinical Presentation Comparison

Resolving or healing pressure ulcers. Because scar tissue is present (hypopigmented areas), these were at least Stage III or Stage IV sacral pressure ulcers. Dark pigmented skin when wounded, results in significant yet temporary pigmentation changes. The areas appear pink (hypopigmented) and the margins-periwound appear hypopigmented while the tissue is “healing.” Near normal pigmentation may return over time. It begins with small purple-brown hyperpigmented macules that expand filling the hypopigmented area.
Clinical Presentation Comparison

Note the periwound hyperpigmentation reaction to the inflammation. This can be very difficult to differentiate from suspected deep tissue injury.

Clinical Presentation Comparison

Note characteristics of the wound margin and periwound area (4 cm beyond margin). Hyperpigmentation is present due to the inflammatory response. Difficult to determine if tissue is bruised, infected or suspected deep tissue injury.

Clinical Presentation Comparison

From the photo, it is very difficult to determine what is viable versus nonviable tissue on this person. This is why clinicians cannot rely on visual cues alone in dark pigmented individuals. Thorough skin and wound assessment must involve:

- Touching
- Feeling
- Asking
- Smelling
Clinical Presentation Comparison

Visually, these two ulcers present similarly, however the etiologies are very different.

- 10% of African Americans are heterozygous for the sickle cell gene.
- Of those with the disease, 25-75% develop sickle cell ulcers.
- They typically arise from vaso-occlusion, trauma, and infection and tend to have a high propensity for colonization.
- The ulcers are common at the malleolus, and patients frequently present with multiple ulcerations unilaterally or bilaterally.
- Severe pain is common and young male adults (10-50) are most often affected.

Sickle Cell Ulceration

Differential diagnosis: venous/arterial insufficiency
- Crusting nodules in the distal one third of the leg
- Absence of hair follicles, hyperpigmentation, and atrophy of subcutaneous fat
- Periosteal thickening of underlying bone is associated with this pathology

Clinical Presentation Comparison

Adverse drug reaction in dark skin (left) and light skin (right). Note the difference in the erythematous response.
Stevens-Johnson Syndrome in dark and light skin. Lesions appear hyperpigmented and somewhat flush in dark skin and red and elevated in light skin.

Kaposis sarcoma presents as confluent macules on dark skin and purple/red elevated nodules on light skin. Same disease with significantly different clinical presentation.

Presentation of shingles. Pattern still follows dermatome, yet different pigmentary response to active and resolved lesions.
Maturing scar tissue on dark and light skin. Black individuals are 2-19 times more likely to develop Keloids than their Caucasian counterparts. (Connolly, Bikowski 2006)

Hypertrophic scar - scar tissue is raised and rigid yet confined to the boundaries of the initial injury.

Keloid scar - scar tissue that extends well beyond the boundaries of the initial injury. This photo shows a Keloid after an ear piercing.

Summary

- Physiologically and histologically, few differences between Caucasian and Non-Caucasian skin
  - Mostly rate of melanocyte production
- Dark skin has unique normal dermatological variations
- Skin and wound assessment must be thorough and comprehensive
  - Use all senses
- As the population ages and as ethnic populations increase, awareness of normal and abnormal skin variations is critical
For more information about this or other educational activities, please contact:
info@amtwoundcare.com

References

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