Care CEUs

Continuing Education for Nursing Home Administrators

# Impaired Skin Integrity in Older Adult Patient Populations

## Introduction

Impaired skin integrity can lead to infection, impaired mobility, loss of functionality, loss of limb(s) as well as decreased health, overall well-being, quality of life, and even death. Therefore, impaired skin integrity is a major concern for older adult patients. Health care professionals should possess insight into impaired skin integrity to best serve older adult patients. This course provides insight into impaired skin integrity to build awareness among health care professionals so they may safely and effectively identify, evaluate, assess, and address impaired skin integrity in older adult patient populations.

## Section 1: Impaired Skin Integrity

Older adult patients may be at a higher risk for impaired skin integrity, when compared to other patient populations. Therefore, health care professionals should possess insight into impaired skin integrity to best serve older adult patients. This section of the course provides insight into impaired skin integrity, which may be used to optimize older adult patient care. The information found in this section was derived from materials provided by the Centers for Disease Control and Prevention (CDC), the Joint Commission, the National Council on Aging and the World Health Organization (WHO) (Centers for Disease Control and Prevention, 2020; Joint Commission, 2016; National Council on Aging, 2020; World Health Organization, 2020).

### *What is skin integrity?*

The term skin integrity may refer to skin health. Health care professionals should note that healthy skin does not, typically, show damage, disruption, or loss of functionality; healthy skin is, essentially, intact skin.

### *What is impaired skin integrity?*

Impaired skin integrity may refer to a skin diagnosis that can be used to identify relatively unhealthy skin that may show damage, disruption, loss of functionality, and/or may not be intact.

## *What healthcare-related factors may be associated with impaired skin integrity?*

The healthcare-related factors or risk factors associated with impaired skin integrity include the following: pressure, trauma, moisture, an injury involving the skin, immobility, poor nutrition, poor hydration, inadequate hygiene, impaired mental status, and age.

## *Why are older adults at a higher risk for impaired skin integrity when compared to other patient populations?*

The skin is the biggest organ in the human body. It is responsible for protection, body temperature regulation, maintaining water and electrolyte balance, pain sensation, sensation to external stimuli, and it plays a role in the production of Vitamin D. Additionally, the skin acts as a barrier to infectious agents that may be present in a given environment (an infectious agent may refer to a pathogen which possesses the potential to enter a host, multiply, and lead to infection). The three primary layers of the skin include: the epidermis, the dermis, and the subcutaneous layer, also referred to as the fat layer. The epidermis may refer to the thin, tough, outer layer of the skin. The function of the epidermis is to act as a barrier to infection while regulating the release of water from the human body. The dermis may refer to the thick layer of skin, under the epidermis, which contains blood capillaries, nerve endings, sweat glands, and hair follicles. The function of the dermis is to support the epidermis while providing the skin with both strength and flexibility. The subcutaneous layer, or fat layer, may refer to the innermost layer of skin. The functions of the subcutaneous layer include the following: protection and temperature regulation. The subcutaneous layer also serves as a passageway for the nerves and blood vessels from the dermis to the muscles. Over time, the aforementioned layers of skin undergo degenerative changes (i.e., changes that may cause the skin to lose functionality and/or become damaged). Thus, older adults (individuals 65 years or older) are at a higher risk for impaired skin integrity due to the degenerative changes that occur to the skin over time.

The degenerative changes that occur to the skin over time may be intrinsic and/or extrinsic. Intrinsic changes may refer to changes that result from the natural biological occurrences of the human body. Extrinsic changes may refer to changes that result from external or environmental factors (e.g., ultra-violet radiation, cigarette smoking, air pollution).

Health care professionals should note that older adults often suffer from chronic diseases, such as diabetes and cardiovascular disease, which reduce the skin's ability to repair damage.

## *How can health care professionals adequately identify, evaluate and assess impaired skin integrity?*

Health care professionals may adequately identify, evaluate and assess impaired skin integrity by conducting an adequate patient assessment. An adequate patient assessment, as it relates to the presence of impaired skin integrity, is one that safely and effectively identifies impaired skin integrity, while attempting to determine the potential cause, type, intensity, pain and related complications associated with impaired skin integrity. Health care professionals should note that impaired skin integrity-related patient assessments may occur at any point in the health care process and may be used to both identify and monitor impaired skin integrity. Health care professionals should also note that an adequate patient assessment regarding impaired skin integrity may include the following elements: etiology determination, nutritional and hydration status determination, mobility determination, impaired tissue integrity/condition, wound characteristics, recognition of high-risk areas, pressure injury evaluation, signs of itching, patient pain and discomfort, patient vital signs, patient management goals, and health care documentation. Specific information regarding the aforementioned elements of an adequate patient assessment related to impaired skin integrity may be found below.

- ***Etiology determination*** - when assessing patients it is important for health care professionals to determine the etiology of impaired skin integrity (i.e., the cause(s) of the unhealthy skin/the cause of the observed skin damage, disruption and/or loss of functionality). Etiology determination is important because the cause of a patient's unhealthy skin may play a vital role in determining safe and effective methods to address impaired skin integrity. As previously mentioned, potential causes of impaired skin integrity include the following factors: pressure, trauma, moisture, an injury involving the skin, immobility, poor nutrition, poor hydration, inadequate hygiene, impaired mental status, and age. Health care professionals should note the following: when attempting to determine the etiology of impaired skin integrity, health care professionals should work to obtain information that may be relevant to an individual patient's specific impaired skin integrity such as the following: is the impaired skin integrity related to an acute wound or chronic wound, is the impaired skin integrity related to a burn, is the impaired skin integrity related to a dermatological lesion (a dermatological lesion may refer to an abnormal growth on the skin such as a lump or bump) and/or can the impaired skin integrity

be classified as a type of skin ulcer( the term skin ulcer, in the context of this course, may refer to an open sore or wound on the skin).

- ***Nutritional and hydration status determination*** - a patient's nutritional and hydration status can play an important role in determining the etiology of impaired skin integrity. A patient's nutritional and hydration status can also play an important role in addressing impaired skin integrity. Health care professionals should note that inadequate nutrition/hydration may lead to impaired skin integrity.

- ***Mobility determination*** - a patients mobility or lack of mobility can also play an important role in determining the etiology of impaired skin integrity, and, much like with a patient's nutritional status, patient mobility can play an important role in addressing impaired skin integrity. Health care professionals should note the following: patients with decreased mobility may be at a higher risk for impaired skin integrity.

- ***Impaired tissue integrity/condition*** - when assessing a patient's impaired skin integrity, health care professionals should work to evaluate the presence of impaired tissue integrity as well as the condition of the patient's skin. Information regarding impaired tissue integrity/condition can provide a context for addressing impaired skin integrity. Health care professionals should note the following: when evaluating impaired tissue integrity/condition, health care professionals should look for the following characteristics of localized skin/tissue damage: redness, swelling, pain, and burning.

- ***Wound characteristics*** - to build on the previous assessment element, health care professionals should be sure to observe and note the characteristics of a patient's impaired skin integrity-related wound(s), when applicable. Important wound characteristics that should be observed and noted during a patient assessment include the following: wound color, length, width, depth, drainage, and odor. Health care professionals should note that each of the aforementioned wound characteristics may provide specific relevant information to the intensity and/or extent of a patient's wound(s) (e.g., pale tissue color may be a sign of decreased oxygenation; a pungent/bad odor may be an indication of site infection; wound pus and/or purulent discharge may be an indication of site infection).

- ***Recognition of high-risk areas*** - when assessing patients, health care professionals should devote a portion of their attention to impaired skin integrity-related high-risk areas. Such high-risk areas include areas of the skin that cover: the shoulders, elbows, knees, as well as the tailbone and hip bones. Such areas are high risk because they cover bony prominences of the human body, which are especially susceptible to extended pressure and, thus, especially susceptible to impaired skin

integrity. Health care professionals should note the following: if a patient is experiencing impaired skin integrity in a high-risk area, the area should be monitored and routinely observed; health care professionals should make special efforts to address impaired skin integrity in high-risk areas in a timely manner; a failure to address impaired skin integrity in high-risk areas in a timely manner may result in extended damage, disruption, and loss of functionality; a failure to address impaired skin integrity in high-risk areas in a timely manner may also result in infections, which often possess the potential for high patient morbidity and mortality rates; patients with decreased mobility may be at a higher risk for impaired skin integrity in high-risk areas. Health care professionals should also note that high-risk areas may be vulnerable to pressure injuries; health care professionals should evaluate the presence of pressure injuries when assessing patients.

- ***Pressure injury evaluation*** - a pressure injury, also referred to as a pressure ulcer or bedsore, may refer to localized damage to the skin and/or underlying soft tissue, usually over a bony prominence. Pressure injuries typically result from intense and/or prolonged pressure. A pressure injury can present as intact skin or an open ulcer. Pressure injuries can be painful to patients, and typically affect high-risk patient populations such as older adults. When evaluating the presence of pressure injuries, health care professionals should attempt to identify the stage or type of pressure injury. Specific information regarding the different stages/types of pressure injuries may be found below.

    - **Stage 1 pressure injury** - Stage 1 pressure injuries are characterized by intact skin with a localized area of non-blanchable erythema (i.e., stage 1 pressure injuries are characterized by a superficial reddening of the skin that, when pressed, does not turn white).

    - **Stage 2 pressure injury** - Stage 2 pressure injuries are characterized by partial-thickness skin loss with exposed dermis; a stage 2 pressure injury wound bed is typically viable, pink or red, moist, and may present as an intact or ruptured serum-filled blister; adipose (fat) is not visible and deeper tissues are not visible; granulation tissue, slough and eschar are not present. Slough may refer to a layer or mass of necrotic or dead tissue. Eschar may refer to dead tissue that sheds or falls from the skin.

    - **Stage 3 pressure injury** - Stage 3 pressure injuries are characterized by full-thickness loss of skin, in which adipose (fat) is visible in the ulcer and granulation tissue and epibole (epibole may refer to rolled wound edges) are often present; slough and/or eschar may be visible; the depth of tissue

damage varies by anatomical locations; undermining and tunneling may occur; fascia, muscle, tendon, ligament, cartilage and/or bone are not exposed.

- **Stage 4 pressure injury** - Stage 4 pressure injuries are characterized by full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage or bone in the ulcer; slough and/or eschar maybe visible; epibole, undermining and/or tunneling often occur; depth varies by anatomical location.

- **Unstageable pressure injury** - unstageable pressure injuries are characterized by full-thickness skin and tissue loss in which the extent of the tissue damage within the ulcer cannot be confirmed because it is obscured by slough or eschar; if slough or eschar is removed, a Stage 3 or Stage 4 pressure injury may be revealed. Health care professionals should note the following regarding an unstageable pressure injury: stable eschar on an ischemic limb or the heel(s) should not be removed; stable eschar may refer to eschar/dead tissue that is dry, adherent, and intact without erythema or fluctuance.

- **Deep tissue pressure injury** - deep tissue pressure injuries are characterized by intact or non-intact skin with localized area or persistent non-blanchable deep red, maroon, purple discoloration or epidermal separation revealing a dark wound bed or blood-filled blister; pain and temperature changes often preceded skin color changes; discoloration may appear differently in darkly pigmented skin. Health care professionals should note the following regarding a deep tissue pressure injury: deep tissue pressure injuries typically result from intense and/or prolonged pressure and shear forces at the bone-muscle interface; the wound may evolve rapidly to reveal the actual extent of tissue injury, or may resolve without tissue loss; if necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle or other underlying structures are visible, this indicates a full thickness pressure injury (unstageable, Stage 3 or Stage 4).

- **Medical device-related pressure injury** - medical device-related pressure injuries result from the use of devices designed and applied for diagnostic or therapeutic purposes. Health care professionals should note the following: a medical device-related pressure injury generally conforms to the pattern or shape of the device; the injury should be staged according to the aforementioned stages.

- **Mucosal membrane pressure injury** - a mucosal membrane pressure injury may be found on mucous membranes with a history of a medical device use at the location of the injury. Health care professionals should note the following:

due to the anatomy of the tissue, typically, mucosal membrane pressure injuries cannot be staged.

- ***Signs of itching*** - health care professionals should observe patients for signs of itching when conducting patient assessments (e.g., scratch or nail marks on a patients skin; skin irritation; localized skin irritation). Itching and/or extensive itching can be detrimental to patient care as it relates to impaired skin integrity. Itching and/or extensive itching can lead to excessive patient scratching, which in turn possess the potential to further skin irritation, damage, disruption, and loss of functionality. Furthermore, excessive skin scratching by a patient could open up wounds and or lead to infection(s). Health care professionals should note if patients are experiencing itching and/or extensive itching. Those patients who are experiencing itching and/or extensive itching should be counseled on the detrimental effects of excessive scratching. Those patients should also be observed and routinely monitored. Additionally, health care professionals should work to identify the extent of a patient's scratching and the presence of any related underlying issues that may be causing the patient to experience itching and/or extensive itching. Health care professionals should note the following: in addition to impaired skin integrity, other conditions that may lead to itching and/or extensive itching include: liver disease, kidney disease, nerve disorders, and thyroid disorders.
- ***Patient pain and discomfort*** - along with observing patients for signs of itching, health care professionals should evaluate a patient's level of pain and discomfort when conducting patient assessments. Pain may refer to an unpleasant sensory and emotional experience arising from actual or potential tissue damage. Pain is often associated with impaired skin integrity. Health care professionals may evaluate a patient's pain and related discomfort by using a variety of pain assessment tools which include: a simple numerical pain intensity scale, the WILDA approach assessment guide, the Wong/Baker faces rating scale, the Critical-Care Pain Observation Tool (CPOT), and the Pain Assessment in Advanced Dementia (PAINAD) scale. Specific information regarding each of the aforementioned pain assessment tools may be found below.
    - **A simple numerical pain intensity scale** - in the context of this course, a simple numerical pain intensity scale, when applied to pain assessment, may refer to a numerically based method, which may be used by health care professionals to help patients rate their pain from 0 - 10, with 0 meaning no pain and 10 meaning severe pain or worst possible pain. A simple numerical pain intensity scale may be relatively uncomplicated and/or straightforward, however, it may be the most efficient way for health care professionals to obtain pain-related information from a patient. Health care professionals

should note that simple numerical pain intensity scales may be incorporated into other pain assessment guides, scales, and tools.

- **The WILDA approach assessment guide** - A WILDA approach assessment guide may refer to a pocket-sized template, which may be used by health care professionals as a guide to effectively assess patients' pain. The WILDA approach assessment guide outlines the following five key components to an effective patient assessment: **W**ords to describe pain/a pain description, **I**ntensity rating, **L**ocation identification/pain location, **D**uration, and **A**ggravate/alleviate (i.e., a patient indication of what factors aggravate or alleviate pain). Evidence suggests that effective patient assessments include all of the aforementioned key points. Thus, by following the WILDA approach assessment guide, health care professionals can ensure they cover essential key points to a pain assessment. Health care professionals should note the following: the WILDA approach assessment guide is a guide; every patient possesses the potential to be unique and different, thus, health care professionals may have to implement different strategies and techniques, along with the WILDA approach assessment guide, to effectively assess patients' pain.
- **The Wong/Baker faces rating scale** - the Wong/Baker faces rating scale may refer to a pain assessment tool that may be utilized by health care professionals to determine patients' intensity or level of pain. The Wong/Baker faces rating scale is comprised of faces that typically possess different simplified facial expressions, which are correlated with a numerical pain intensity scale ranging from 0 - 10 (i.e., each face of the Wong/Baker faces rating scale is associated with a numerical value and an expression of pain). To use the scale efficiently, a health care professional only has to show the scale to patients and ask them to select a face that best represents how their experience of pain is making them feel. By simply pointing to an easy to understand picture of a face in pain, patients can provide health care professionals with a pain rating from 0 - 10 as well as valuable insight into their individual experience of pain. Health care professionals should note that the Wong/Baker faces rating scale may be ideal for older adult patients, patients with language barriers, and patients that simply have trouble associating a numerical value with their experience of pain.
- **The Pain Assessment in Advanced Dementia (PAINAD) scale** - the PAINAD scale may refer to a pain assessment tool that can be used by health care professionals to assess pain in patients/older adult patients with advanced

dementia (dementia may refer to a cluster of symptoms centered around an inability to remember, think clearly, and/or make decisions). The PAINAD scale is divided into the following five categories: breathing independent of vocalization, negative vocalization, facial expression, body langue, and consolability. Each of the previous categories have specific criteria that are associated with numerical values. To use the scale effectively, health care professionals should observe patients and score the previous categories accordingly. Once each category has been scored, health care professionals may then tabulate the category scores to arrive at a total pain-associated value. Health care professionals should note that the PAINAD scale total pain-associated value should be between 0 - 10, with 0 meaning no pain and 10 meaning severe pain or worst possible pain.

- **The Critical-Care Pain Observation Tool (CPOT)** - the CPOT may refer to a pain scale that relies on the observations of health care professionals to assess critically ill patients and/or older adult patients that may have difficulties communicating relevant pain information. The CPOT rates/scores pain on a scale from 0 - 8 and is broken down into the following four categories: facial expression, body movements, compliance with a ventilator for intubated patients or vocalization for extubated patients, and, finally, muscle tension. To use the scale effectively health care professionals should observe patients and score the previous categories accordingly. After the completion of each category, category scores can then be added up to provide a patient's final pain rating/score. Health care professionals should note the following: when utilizing the CPOT, patient muscle tension should be evaluated by passive flexion and extension of upper extremities.

- ***Patient vital signs*** - it is important for health care professionals to observe and monitor patient vital signs, especially in high-risk patient populations (e.g., older adults) suffering from impaired skin integrity. Observing and monitoring patient vital signs can help prevent the complications associated with impaired skin integrity, which include the following: infection, impaired mobility, decreased functionality, loss of limb(s), and death. Health care professionals should note the following signs and symptoms of impaired skin integrity-related infections: fever, malaise, pain, swelling around the area of impaired skin integrity, redness on, near or around the area of impaired skin integrity, a pungent odor emanating from the area of impaired skin integrity, and purulent drainage. Purulent drainage may refer to a liquid or discharge that oozes from a wound, which may be whitish, greenish, yellowish, grayish, and/or brownish in color and may be associated with an odd or musty odor.

- ***Patient management goals*** - patient management goals regarding impaired skin integrity may include the following: continue to assess patient-related impaired skin integrity; continue to assess high-risk areas such as areas of the skin that cover the shoulders, elbows, knees, as well as the tailbone and hip bones; observe, monitor and evaluate pressure injuries, when applicable; assess the overall condition of a patient's skin; observe and monitor patient signs of itching such as scratch or nail marks on a patients skin, skin irritation and/or localized skin irritation; observe and monitor patient pain and discomfort; observe and monitor patient vital signs; observe and monitor the site of impaired skin integrity at least once daily for color changes, redness, swelling, pain, or other signs of infection; observe and monitor the skin around the area of impaired skin integrity; address the impaired skin integrity as needed; improve and/or maintain adequate patient hydration; improve and/or maintain adequate patient nutrition; address patient mobility or lack of mobility, when applicable; ensure patient skin remains intact; educate patient regarding adequate skin care; educate patient regarding adequate hydration and nutrition: educate patient regarding adequate personal hygiene; work to prevent further and/or additional patient-related impaired skin integrity.
- ***Health care documentation*** - finally, health care professionals should complete health care documentation when assessing patient-related impaired skin integrity. Health care documentation may refer to a digital or an analog record detailing the administration of health care to patients. When completing health care documentation centered around patient impaired skin integrity, health care professionals should include information relevant to the patient, patient's impaired skin integrity, and relevant information related to the previously highlighted elements of an adequate patient assessment regarding impaired skin integrity. Health care professionals should note that health care documentation may be vital to addressing impaired skin integrity.

## What professional skills and tools should health care professionals employ while attempting to identify, evaluate and assess impaired skin integrity?

Specific health care professional skills and tools may be required to adequately identify, evaluate and assess impaired skin integrity. Such skills and tools are highlighted below. Health care professionals should note that the health care professional skills and tools found below may also be essential to effectively addressing and managing impaired skin integrity.

- ***Observation/patient monitoring*** - as previously alluded to, health care professionals should observe and monitor older adult patients for the signs and symptoms of impaired skin integrity. Health care professionals should note that the

signs and symptoms of impaired skin integrity include the following: damaged or destroyed tissue, skin and tissue color changes (e.g., red, purplish, black), local pain, local tenderness, and swelling. Health care professionals should also note that patient observation can also play an important role in patient monitoring. Due to the nature of impaired skin integrity in older adult patients, it is important to the administration of health care that older adult patients suffering from impaired skin integrity are routinely monitored. Any changes to a patient's skin, vital signs, demeanor, eating habits, mobility, and overall health should be documented and reported.

- ***Health care documentation*** - as previously mentioned, health care documentation may refer to a digital or an analog record detailing the administration of health care to patients. If completed effectively, health care documentation can be used in daily practice by health care professionals to communicate vital patient information to other health care professionals in order to facilitate positive health care outcomes and to decrease the potential for negative health care outcomes, such as adverse events and patient mortalities. Regarding impaired skin integrity, effective health care documentation may be used as a method to review patient cases and to ensure all aspects of an individual patient's health care are noted and evaluated to maximize therapeutic outcomes.

  In order for health care documentation to be considered effective, it must function as a viable form of communication, as well as a means to establish a detailed record of health care administration. There are many different forms of health care documentation - however, if health care professionals include specific characteristics in their documentation, they can ensure the documentation will be effective.

  The first characteristics of effective documentation are objectivity and accuracy. Health care documentation should include objective information free of subjective judgment, bias, or opinion. Health care documentation should also be accurate - meaning it should include information that can be measured or verified by another individual.

  Additional characteristics of effective health care documentation include clarity and completeness. Clarity, as it relates to health care documentation, may refer to a quality which enables multiple health care professionals to obtain meaning from recorded data and/or information relating to health care. Completeness, as it relates to health care documentation, may refer to a state where all of the necessary components and/or parts are present. Only when clarity and completeness are achieved can health care documentation be considered effective.

Finally, the information found within health care documentation should be readily accessible and available to all those who require it. Thus, health care professionals must include accurate times and dates of health care administration when completing their health care documentation to further its effectiveness. Health care professionals should note that older adult patients suffering from impaired skin integrity may require special attention and consideration. Completing effective health care documentation can help health care professionals ensure said patients receive the care they require.

- ***Effective hand hygiene*** - healthcare-associated infections are a patient safety issue affecting all types of health care organizations and patient populations. With that said, evidence suggests that older adult patients may be more susceptible to healthcare-associated infections when compared to other patient populations. Thus, health care professionals should work to prevent healthcare-associated infections when administering health care to older adult patients. One of the most important ways to address healthcare-associated infections is by practicing effective hand hygiene. Hand hygiene may refer to the process of cleaning hands in order to prevent contamination and/or infections. Hand hygiene is most effective when dirt, soil, microorganisms, and other contaminants are removed from the hands. Health care professionals should complete effective hand hygiene when identifying, evaluating, assessing, and addressing impaired skin integrity. Specific information regarding hand hygiene may be found below.

    - Health care professionals may use a variety of different products to carry out effective hand hygiene. The following products are typically available to health care professionals and may be used to carry out effective hand hygiene: detergents, plain soap, antimicrobial (medicated) soap, antiseptic agents, and alcohol-based hand rubs.

    - Health care professionals should select efficacious hand hygiene products that have low irritancy potential.

    - When selecting hand hygiene products, health care professionals should determine any known interaction between products used to clean hands, skincare products, and the types of glove used in a specific health care facility.

    - When selecting hand hygiene products, health care professionals should solicit and evaluate information from manufacturers regarding any effect that hand lotions, creams, or alcohol-based hand rubs may have on the effects of antimicrobial soaps being used in the institution.

- When selecting hand hygiene products, health care professionals should solicit information from manufacturers about the risk of product contamination.
- Health care professionals should ensure that hand hygiene product-related dispensers function adequately and reliably and deliver an appropriate volume of the product.
- Health care professionals should ensure that the dispenser system for alcohol-based hand rubs is approved for flammable materials.
- Health care professionals should not add soap or alcohol-based formulations to a partially empty soap dispenser.
- If soap dispensers are reused, health care professionals should follow recommended procedures for cleansing.
- The major indications for hand hygiene can be broken down into the following five key moments:
    1. Before patient contact
    2. Before an aseptic procedure or task
    3. After a body fluid exposure risk occurs
    4. After touching a patient
    5. After contact with a patient's surroundings
- Health care professionals should wash their hands with soap and water when they are visibly dirty or visibly soiled with blood or other body fluids or after using the toilet.
- Health care professionals should use an alcohol-based hand rub when their hands are not visibly soiled to reduce bacterial counts.
- Health care professionals should engage in hand hygiene if exposure to potential spore-forming pathogens is strongly suspected or proved (handwashing with soap and water is the preferred means).
- Health care professionals should engage in hand hygiene before handling an invasive device for patient care.
- Health care professionals should engage in hand hygiene after contact with body fluids or excretions, mucous membranes, non-intact skin, or wound dressings.

- Health care professionals should engage in hand hygiene if moving from a contaminated body site to another body site during the care of the same patient.
- Health care professionals should engage in hand hygiene after contact with inanimate surfaces and objects (including medical equipment) in the immediate vicinity of a patient.
- Health care professionals should engage in hand hygiene after removing sterile or non-sterile gloves.
- Health care professionals should engage in hand hygiene before handling medications (hand hygiene in the previous case may include the use of an alcohol-based hand rub or handwashing with either a plain or antimicrobial soap and water).
- Health care professionals should engage in hand hygiene before preparing food (hand hygiene in the previous case may include the use of an alcohol-based hand rub or handwashing with either a plain or antimicrobial soap and water).
- When engaging in hand hygiene, health care professionals should remember the following note: soap and an alcohol-based hand rub should not be used concomitantly.
- To carry out effective hand hygiene, health care professionals should follow the following steps when using soap and water (health care professionals should note that the duration of the entire handwashing procedure with soap and water should last between 40 - 60 seconds).



<u>Hand Hygiene Procedure with Soap and Water</u>

1. The health care professional should wet his or her hands with water.
2. The health care professional should apply enough soap to cover all hand surfaces.
3. The health care professional should rub his or her hands palm to palm.
4. The health care professional should rub the right palm over the left dorsum with interlaced fingers and vice versa.
5. The health care professional should rub his or her hands palm to palm with fingers interlaced.

6. The health care professional should rub the backs of fingers to opposing palms with fingers interlocked.

7. The health care professional should engage in rotational rubbing of the left thumb clasped in the right palm and vice versa.

8. The health care professional should engage in rotational rubbing, backward and forward with clasped fingers of the right hand in the left palm and vice versa.

9. The health care professional should then rinse his or her hands with water.

10. The health care professional should then dry his or her hands thoroughly with a single-use towel.

11. Finally, the health care professional should use a towel to turn off the faucet.

- Health care professionals may also use an alcohol-based formulation when practicing effective hand hygiene. Health care professionals should follow the steps in the following procedure when using an alcohol-based formulation to optimize hand hygiene results. The duration of the entire procedure should last between 20 - 30 seconds. When using an alcohol-based formulation health care professionals should note the following: alcohol-based hand rubs with optimal antimicrobial efficacy usually contain 75% to 85% ethanol, isopropanol, or n-propanol, or a combination of the aforementioned products. Health care professionals should also note that when engaging in hand hygiene, soap and an alcohol-based hand rub should not be used concomitantly.



<u>Hand Hygiene Procedure with an Alcohol-based Formulation</u>

1. The health care professional should first apply a palmful of alcohol-based products in a cupped hand, making sure to cover all surfaces.

2. The health care professional should then rub his or her hands palm to palm.

3. The health care professional should rub the right palm over the left dorsum with interlaced fingers and vice versa.

4. The health care professional should rub his or her hands palm to palm with fingers interlaced.

5. The health care professional should rub the backs of his or her fingers to opposing palms with fingers interlocked.

6. The health care professional should engage in the rotational rubbing of the left thumb clasped in the right palm and vice versa.

7. The health care professional should engage in rotational rubbing, backward and forwards with clasped fingers of the right hand in the left palm and vice versa.

8. Finally, health care professionals should note that their hands are safe once they are dry.

- ***Personal protective equipment (PPE)*** - another way health care professionals can help limit healthcare-associated infections is by donning personal protective equipment (PPE). PPE may refer to equipment designed to protect, shield, and minimize exposure to hazards that may cause serious injury, illness and/or disease. Essentially, donning PPE can prevent the spread of infectious materials and agents to patients. PPE can include a variety of different types of equipment such as gowns, masks, goggles, face shields, respirators, and gloves. Specific information regarding individual pieces of PPE may be found below.

  **Gown**

  *Background information* - the gown may be one of the most recognizable pieces of PPE. The purpose of a gown is to protect an individual's torso and arms from potential contamination. Gowns are typically clean or sterile and often resistant to fluids.

  *Donning PPE* - when putting on a gown, a health care professional should make sure the gown completely covers his or her torso from the neck to the knees. The gown should also completely cover a health care professional's arms and wrists. Additionally, a gown should be wrapped around the back and fastened at the back of the neck and waist.

  *Removing PPE* - to effectively remove a gown, a health care professional should unfasten the gown's ties and pull the gown away from the neck and shoulders. When the gown is removed from the body, it should be rolled or folded and placed in the appropriate waste container. Health care professionals should wash their hands or use an alcohol-based hand sanitizer after removing all PPE.

  **Mask**

*Background information* - the mask is another very recognizable piece of PPE. The purpose of a mask is to protect a health care professional's face from potentially infectious materials.

*Donning PPE* - when putting on a mask, a health care professional should make sure the mask completely covers his or her mouth and nose. A health care professional should also ensure a mask fits snugly to the face and below the chin. Often masks can be secured to the head and neck via separate ties.

*Removing PPE* - to effectively remove a mask, a health care professional should untie the bottom ties, if applicable, followed by the upper ties. The mask should then be pulled off and discarded in the appropriate waste container. A health care professional should not touch a contaminated mask. Health care professionals should wash their hands or use an alcohol-based hand sanitizer after removing all PPE.

**Goggles**

*Background information* - goggles are typically worn with a mask. The purpose of goggles is to protect the eyes from potentially infectious materials.

*Donning PPE* - when putting on goggles, a health care professional should make sure the goggles fit snugly around the eyes. If a health care professional wears personal prescription lenses, the goggles should fit snugly around his or her personal prescription lenses. Furthermore, goggles should be properly adjusted on the face to maximize vision and protection.

*Removing PPE* - to effectively remove goggles from the face, a health care professional should take off the goggles from the back by lifting the goggle's band and pulling them forward. If the goggles are not reusable they should be placed in the appropriate waste container. A health care professional should not touch contaminated goggles. Health care professionals should wash their hands or use an alcohol-based hand sanitizer after removing all PPE.

**Face Shields**

*Background information* - a face shield can be worn in place of goggles. The purpose of a face shield is to protect the eyes, nose, and mouth from potentially infectious materials.

*Donning PPE* - when putting on a face shield, health care professionals should make sure the face shield covers the forehead, extends below the chin, and wraps around the side of the face.

*Removing PPE* - to effectively remove a face shield, a health care professional should take off the face shield from the back by lifting the face shield's band and pulling it forward. If the face shield is not reusable, it should be placed in the appropriate waste container. A health care professional should not touch a contaminated face shield. Health care professionals should wash their hands or use an alcohol-based hand sanitizer after removing all PPE.

**Respirator**

*Background information* - the purpose of a respirator is to protect a health care professional from hazardous and/or infectious aerosols. There are many types of respirators available to health care professionals including particulate respirators, half-face elastomeric respirators, full-face elastomeric respirators, and powered air-purifying respirators. The most common type of respirators used by health care professionals are particulate respirators. When selecting a specific type of respirator, health care professionals should consider the type of exposure risk associated with patient care. A "fit test" may be required to determine the appropriate size respirator needed for each individual health care professional. Health care professionals may also require training regarding how and when to use a respirator.

*Donning PPE* - when putting on a respirator, a health care professional should make sure the respirator completely covers his or her mouth and nose. Health care professionals should also ensure the respirator fits snug to the face and below the chin. Additionally, a health care professional should be sure the respirator is properly sealed.

*Removing PPE* - to effectively remove a respirator, a health care professional should untie the bottom ties, if applicable, followed by the upper ties. The respirator should then be pulled off and discarded in the appropriate waste container. A health care professional should not touch a contaminated respirator. Health care professionals should wash their hands or use an alcohol-based hand sanitizer after removing all PPE.

**Gloves**

*Background information* - gloves are often the most common piece of PPE used by health care professionals. The two main reasons why health care professionals should wear gloves include the following - to reduce the risk of contamination of health care professionals' hands with blood and other body fluids and to reduce the risk of germ dissemination to the environment and/or transmission from the health care worker to the patient and vice versa, as well

as from one patient to another. When wearing gloves, health care professionals should avoid touch contamination. Touch contamination may refer to touching one's self and/or other surfaces such as tables, light switches, and doors while wearing gloves. Touch contamination may lead to contamination and/or the passing of potentially infectious materials. Health care professionals should also remember to change their gloves as they administer care to different patients (i.e., a new patient means a new pair of gloves).

*Donning PPE* - when putting on a pair of gloves, a health care professional should make sure the gloves extend to cover the wrists of isolation gowns, when applicable. Gloves are often the last piece of PPE donned when putting on required PPE. When donning gloves, health care professionals should adhere to the following steps:

1. Health care professionals should note the following - when an indication for hand hygiene precedes contact that also requires glove usage, hand rubbing with an alcohol-based hand rub or handwashing with soap and water should be performed before donning gloves.
2. Take out a glove from its original box.
3. Health care professionals should be sure to touch only a restricted surface of a glove corresponding to the wrist (at the top edge of the cuff).
4. Don the first glove.
5. Take the second glove with the bare hand and be sure to touch only a restricted surface of a glove corresponding to the wrist (at the top edge of the cuff).

Health care professionals should note the following - to avoid touching the skin of the forearm with the gloved hand, turn the external surface of the glove to be donned on the folded fingers of the gloved hand, thus permitting to glove the second hand (don the second glove).

Health care professionals should note the following - once both hands are gloved, hands should not touch anything else that is not defined by indications and conditions for gloved use.

*Removing PPE* - to effectively remove a pair of gloves, a health care professional should use one gloved hand to grasp the palm area of the other

gloved hand. Once the health care professional has a firm grip on the palm of one gloved hand, the health care professional should then peel off the first glove. After removing the first glove, the health care professional should then hold that glove in one hand. Using his or her fingers, the health care professional should slide the fingers off his or her ungloved hand under the remaining glove at the wrist and peel off the second glove right over the first glove. Both gloves should then be placed in the appropriate waste container.

If health care professionals are wearing a gown with gloves, they may also remove their gloves when they are removing their gowns. To do so, health care professionals should peel off each glove as they roll or fold their gowns before disposal. Both the gloves and the gown should then be discarded in the appropriate waste container. When removing a pair of gloves with a gown, health care professionals should ensure they do not touch the gloves or the gown with their bare hands. Health care professionals should wash their hands or use an alcohol-based hand sanitizer after removing all PPE.

- ***Aseptic dressing techniques*** - some patients may require dressings for their impaired skin integrity. Thus, health care professionals should be familiar with aseptic dressing techniques. Aseptic dressing techniques may refer to the practices and procedures designed to prevent and avoid introducing infectious agents to a wound while applying and/or changing dressings. The key elements of aseptic dressing techniques include the following: preparation, appropriate dressings, effective hand hygiene, adequate and effective use of PPE, removing old dressings, when applicable, wound assessment, wound cleaning, wound dressing, appropriate disposal of waste, patient education, and health care documentation. Health care professionals should be familiar with each of the aforementioned elements of aseptic dressing techniques. Health care organizations and administrators should ensure health care professionals adhere to aseptic dressing techniques when addressing impaired skin integrity which may require the application and/or changing of dressings.

- ***Fall precautions*** - applying fall precautions to patients may not be the first thing that comes to mind when considering impaired skin integrity. However, injuries that result from patient falls may greatly impact skin integrity. Thus, health care professionals should consider fall precautions when addressing impaired skin integrity to ensure patient safety and to help prevent patient falls, which posses the potential to cause patient injury and, ultimately, impaired skin integrity. Health care professionals should note that fall precautions constitute the basics of patient safety and should be applied in all health care facilities to all patients. Specific fall precautions may be found below.

- Familiarize the patient with the environment
- Have the patient demonstrate call light use
- Maintain call light within reach
- Keep the patient's personal possessions within patient safe reach
- Have sturdy handrails in patient bathrooms, room, and hallway
- Place the hospital bed in low position when a patient is resting in bed; raise the bed to a comfortable height when the patient is transferring out of bed
- Keep hospital bed brakes locked
- Keep wheelchair wheel locks in - locked position when stationary
- Keep nonslip, comfortable, well-fitting footwear on the patient
- Use night lights or supplemental lighting
- Keep floor surfaces clean and dry
- Clean up all spills promptly
- Keep patient care areas uncluttered
- Follow safe patient handling practices

- ***Health care organization policies and procedures*** - health care organizations' policies and procedures, regarding patient care, can be important tools when identifying, evaluating, and assessing impaired skin integrity. In essence, health care organizations' policies and procedures, regarding patient care, can help guide health care professionals and ensure they understand how to safely and effectively administer health care to patients in need. Furthermore, specific health care organizations' policies and procedures, related to impaired skin integrity, can highlight vital information that can be used by health care professionals to adequately address impaired skin integrity. Health care professionals should note the following: health care professionals should be aware of health care organizations' policies and procedures regarding patient care; if no such policies exist within a health care organization, health care professionals should consider developing such policies to foster safe and effective health care. Health care administrators should note the following: health care organizations should ensure health care professionals understand internal policies related to patient care; it is not enough for a health care organization to have policies regarding patient care

and behavior, health care organizations should ensure health care professionals are aware of such policies and understand them; health care administrators should encourage health care professionals to seek out health care organizations' policies and procedures regarding patient care. Health care administrators should also note the following: health care organizations and administrators should work to educate health care professionals regarding impaired skin integrity; education seminars, course, and/or lectures may be used to educate health care professionals regarding impaired skin integrity; health care organizations and administrators should encourage health care professionals to participate in any educational offerings to further their knowledge and understanding of impaired skin integrity and impaired skin integrity in older adult patient populations.

## *Section 1 Summary*

Impaired skin integrity may refer to relatively unhealthy skin that may show damage, disruption, loss of functionality, and/or may not be intact. Healthcare-related factors associated with impaired skin integrity include the following: pressure, trauma, moisture, an injury involving the skin, immobility, poor nutrition, poor hydration, inadequate hygiene, impaired mental status, and age. Older adults are at a higher risk for impaired skin integrity due to the degenerative changes that occur to the skin over time. Health care professionals may adequately identify, evaluate and assess older adult patients suffering from impaired skin integrity by conducting an adequate patient assessment. An adequate patient assessment, as it relates to the presence of impaired skin integrity, is one that safely and effectively identifies impaired skin integrity, while attempting to determine the potential cause, type, intensity, pain and related complications associated with impaired skin integrity. An adequate patient assessment regarding impaired skin integrity may include the following elements: etiology determination, nutritional and hydration status determination, mobility determination, impaired tissue integrity/condition, wound characteristics, recognition of high-risk areas, pressure injury evaluation, signs of itching, patient pain and discomfort, patient vital signs, patient management goals, and health care documentation. Finally, health care professionals should employ specific skills and tools when identifying, evaluating, and assessing patients' impaired skin integrity to ensure the safe and effective administration of health care to patients in need.

## *Section 1 Key Concepts*

- Healthcare-related/risk factors associated with impaired skin integrity include the following: pressure, trauma, moisture, an injury involving the skin, immobility, poor nutrition, poor hydration, inadequate hygiene, impaired mental status, and age.

- The skin is the biggest organ in the human body; the skin is responsible for protection, body temperature regulation, maintaining water and electrolyte balance, pain sensation, sensation to external stimuli, and it plays a role in the production of Vitamin D; additionally, the skin acts as a barrier to infectious agents that may be present in a given environment; the three primary layers of the skin include: the epidermis, the dermis, and the subcutaneous layer, also referred to as the fat layer.
- Older adults are at a higher risk for impaired skin integrity due to the degenerative changes that occur to the skin over time.
- The degenerative changes that occur to the skin over time may be intrinsic and/or extrinsic.
- An adequate patient assessment regarding impaired skin integrity may include the following elements: etiology determination, nutritional and hydration status determination, mobility determination, impaired tissue integrity/condition, wound characteristics, recognition of high-risk areas, pressure injury evaluation, signs of itching, patient pain and discomfort, patient vital signs, patient management goals, and health care documentation.
- The professional skills and tools health care professionals should employ while identifying, evaluating and assessing impaired skin integrity include: observation/ patient monitoring, health care documentation, effective hand hygiene, personal protective equipment (PPE), aseptic dressing techniques, fall precautions, and health care organization policies and procedures.

## *Section 1 Key Terms*

***Skin integrity*** - skin health

***Impaired skin integrity*** - a skin diagnosis that may be used to identify relatively unhealthy skin that can show damage, disruption, loss of functionality and/or may not be intact

***Infectious agent*** - a pathogen which possesses the potential to enter a host, multiply, and lead to infection

***Epidermis*** - the thin, tough, outer layer of the skin

***Dermis*** - the thick layer of skin, under the epidermis, which contains blood capillaries, nerve endings, sweat glands, and hair follicles

***Subcutaneous layer (or fat layer)*** - the innermost layer of skin

***Older adult*** - an individual 65 years or older

***Intrinsic changes*** - changes that result from the natural biological occurrences of the human body

***Extrinsic changes*** - changes that result from external or environmental factors

***Dermatological lesion*** - an abnormal growth on the skin such as a lump or bump

***Skin ulcer (in the context of this course)*** - an open sore or wound on the skin

***Pressure injury (also referred to as a pressure ulcer or bedsore)*** - localized damage to the skin and/or underlying soft tissue, usually over a bony prominence

***Slough*** - a layer or mass of necrotic or dead tissue

***Eschar*** - dead tissue that sheds or falls from the skin

***Epibole*** - rolled wound edges

***Stable eschar*** - eschar/dead tissue that is dry, adherent, and intact without erythema or fluctuance

***Pain*** - an unpleasant sensory and emotional experience arising from actual or potential tissue damage

***A simple numerical pain intensity scale (in the context of this course/when applied to pain assessment)*** - a numerically based method, which may be used by health care professionals to help patients rate their pain from 0 - 10, with 0 meaning no pain and 10 meaning severe pain or worst possible pain

***WILDA approach assessment guide*** - a pocket-sized template, which may be used by health care professionals, as a guide, to effectively assess patients' pain

***Wong/Baker faces rating scale*** - a pain assessment tool that may be utilized by health care professionals to determine patients' intensity or level of pain

***Pain Assessment in Advanced Dementia (PAINAD) scale*** - a pain assessment tool that may be used by health care professionals to assess pain in patients/older adult patients with advanced dementia

***Dementia*** - a cluster of symptoms centered around an inability to remember, think clearly, and/or make decisions

***Critical-Care Pain Observation Tool (CPOT)*** - a pain scale that relies on the observations of health care professionals to assess critically ill patients and/or older adult patients that may have difficulties communicating relevant pain information

***Purulent drainage*** - a liquid or discharge that oozes from a wound, which may be whitish, greenish, yellowish, grayish, and/or brownish in color and may be associated with an odd or musty odor

***Health care documentation*** - a digital or an analog record detailing the administration of health care to patients

***Clarity (as it relates to health care documentation)*** - a quality which enables multiple health care professionals to obtain meaning from recorded data and/or information relating to health care

***Completeness (as it relates to health care documentation)*** - a state where all of the necessary components and/or parts are present

***Hand hygiene*** - the process of cleaning hands in order to prevent contamination and/or infections

***Protective equipment (PPE)*** - equipment designed to protect, shield and minimize exposure to hazards that may cause serious injury, illness and/or disease

***Touch contamination*** - touching one's self and/or other surfaces such as tables, light switches, and doors while wearing gloves

***Aseptic dressing techniques*** - the practices and procedures designed to prevent and avoid introducing infectious agents to a wound while applying and/or changing dressings

### *Section 1 Personal Reflection Question*

How can health care professionals effectively identify, evaluate, and assess impaired skin integrity?

## Section 2: Addressing and Managing Impaired Skin Integrity

It has been established that health care professionals should possess insight into impaired skin integrity. With that said, health care professionals should also be familiar with the therapeutic options that may be used to address and manage

impaired skin integrity. This section of the course will highlight some of the most common therapeutic options that may be used to address and manage impaired skin integrity. The information found in this section was derived from materials provided by the CDC, the Joint Commission, the National Council on Aging, the WHO, the U.S. Department of Health and Human Services, and the United States Food and Drug Administration (FDA) (CDC, 2020; Joint Commission, 2016; National Council on Aging, 2020; WHO, 2020; U.S. Department of Health and Human Services, 2015; United States Food and Drug Administration, 2020).

## *Adequate Nutrition and Hydration*

- One of the most essential elements to addressing and managing impaired skin integrity in older adult patient populations is adequate nutrition and hydration. Thus, health care professionals, as well as health care organizations and administrators, should ensure older adult patients receive and maintain adequate nutrition and hydration. Specific information regarding adequate nutrition and hydration may be found below.

- Older adult patients should receive between 2 - 2.5 liters of fluid per day unless they are medically restricted. Health care professionals should note that the total amount of fluid per day for an older adult patient may depend on factors such as environmental temperatures and patient physical activity levels.

- Male individuals ages 61 - 65 years who are sedentary should take in approximately 2,000 calories per day; male individuals ages 61 - 65 years who are moderately active should take in approximately 2,400 calories per day; male individuals ages 61 - 65 years who are active should take in approximately 2,600 calories per day.

- Female individuals ages 61 - 65 years who are sedentary should take in approximately 1,600 calories per day; female individuals ages 61 - 65 years who are moderately active should take in approximately 1,800 calories per day; female individuals ages 61 - 65 years who are active should take in approximately 2,000 calories per day.

- Male individuals ages 66 - 70 years who are sedentary should take in approximately 2,000 calories per day; male individuals ages 66 - 70 years who are moderately active should take in approximately 2,200 calories per day; male individuals ages 66 - 70 years who are active should take in approximately 2,600 calories per day.

- Female individuals ages 66 - 70 years who are sedentary should take in approximately 1,600 calories per day; female individuals ages 66 - 70 years who are moderately active should take in approximately 1,800 calories per day; female

individuals ages 66 - 70 years who are active should take in approximately 2,000 calories per day.

- Male individuals ages 71 - 75 years who are sedentary should take in approximately 2,000 calories per day; males individuals ages 71 - 75 years who are moderately active should take in approximately 2,200 calories per day; male individuals ages 71 - 75 years who are active should take in approximately 2,600 calories per day.
- Female individuals ages 71 - 75 years who are sedentary should take in approximately 1,600 calories per day; female individuals ages 71 - 75 years who are moderately active should take in approximately 1,800 calories per day; female individuals ages 71 - 75 years who are active should take in approximately 2,000 calories per day.
- Male individuals 75 years and older who are sedentary should take in approximately 2,000 calories per day; Male individuals 75 years and older who are moderately active should take in approximately 2,200 calories per day; male individuals 75 years and older who are active should take in approximately 2,400 calories per day.
- Female individuals 75 years and older who are sedentary should take in approximately 1,600 calories per day; Female individuals 75 years and older who are moderately active should take in approximately 1,800 calories per day; female individuals 75 years and older who are active should take in approximately 2,000 calories per day.
- Individuals should follow a healthy eating pattern across their lifespan. All food and beverage choices matter. Choose a healthy eating pattern at an appropriate calorie level to help achieve and maintain a healthy body weight, support nutrient adequacy, and reduce the risk of chronic disease.
- Individuals should focus on variety, nutrient density, and amount. To meet nutrient needs within calorie limits, choose a variety of nutrient-dense foods across and within all food groups in recommended amounts.
- Individuals should limit calories from added sugars and saturated fats and reduce sodium intake. Consume an eating pattern low in added sugars, saturated fats, and sodium. Cut back on foods and beverages higher in these components to amounts that fit within healthy eating patterns.
- Individuals should shift to healthier food and beverage choices. Choose nutrient-dense foods and beverages across and within all food groups in place of less healthy choices. Consider cultural and personal preferences to make these shifts easier to accomplish and maintain.

- Individuals should support healthy eating patterns for all. Everyone has a role in helping to create and support healthy eating patterns in multiple settings nationwide, from home to school to work to communities.
- An eating pattern may refer to the combination of foods and beverages that constitute an individual's complete dietary intake over time; an eating pattern may describe a customary way of eating or a combination of foods recommended for consumption.
- Individuals should consume a healthy eating pattern that accounts for all foods and beverages within an appropriate calorie level.
- A healthy eating pattern includes:
    - A variety of vegetables from all of the subgroups - dark green, red and orange, legumes (beans and peas), starchy, and other
    - Fruits, especially whole fruits
    - Grains, at least half of which are whole grains
    - Fat-free or low-fat dairy, including milk, yogurt, cheese, and/or fortified soy beverages
    - A variety of protein foods, including seafood, lean meats and poultry, eggs, legumes (beans and peas), and nuts, seeds, and soy products
    - Oils
- A healthy eating pattern limits:
    - Saturated fats and trans fats, added sugars, and sodium
- Individuals should consume less than 10 percent of calories per day from added sugars.
- Individuals should consume less than 10 percent of calories per day from saturated fats.
- Individuals should consume less than 2,300 milligrams (mg) per day of sodium.
- Calorie balance may refer to the balance between the calories taken in from foods and the calories expended from metabolic processes and physical activity.
- Managing calorie intake is fundamental to achieving and maintaining calorie balance. The best way to determine whether an eating pattern is at an appropriate

number of calories is to monitor body weight and adjust calorie intake and expenditure in physical activity based on changes in weight over time.

- All foods and many beverages contain calories, and the total number of calories varies depending on the macronutrients in food. On average, carbohydrates and protein contain 4 calories per gram, fats contain 9 calories per gram, and alcohol has 7 calories per gram. The total number of calories a person needs each day varies depending on a number of factors, including the person's age, sex, height, weight, and level of physical activity. In addition, a need to lose, maintain, or gain weight and other factors affect how many calories should be consumed.

- Adults who are obese should change their eating and physical activity behaviors to prevent additional weight gain and/or promote weight loss. Adults who are overweight should not gain additional weight, and those with one or more CVD risk factors (e.g., hypertension and hyperlipidemia) should change their eating and physical activity behaviors to lose weight. To lose weight, most people need to reduce the number of calories they get from foods and beverages and increase their physical activity. For a weight loss of 1 to 1½ pounds per week, daily intake should be reduced by 500 to 750 calories. Eating patterns that contain 1,200 to 1,500 calories each day can help most women lose weight safely, and eating patterns that contain 1,500 to 1,800 calories each day are suitable for most men for weight loss. In adults who are overweight or obese, if the reduction in total calorie intake is achieved, a variety of eating patterns can produce weight loss, particularly in the first 6 months to 2 years.

- Older adults, ages 65 years and older, who are overweight or obese are encouraged to prevent additional weight gain. Among older adults who are obese, particularly those with CVD risk factors, intentional weight loss can be beneficial and result in improved quality of life and reduced risk of chronic diseases and associated disabilities.

- Protein foods are important sources of nutrients in addition to protein, including B vitamins (e.g., niacin, vitamin B12, vitamin B6, and riboflavin), selenium, choline, phosphorus, zinc, copper, vitamin D, and vitamin E).

- Nutrients provided by various types of protein foods differ. Meats provide the most zinc, while poultry provides the most niacin. Meats, poultry, and seafood provide heme iron, which is more bioavailable than the non-heme iron found in plant sources. Seafood provides the most vitamin B12 and vitamin D, in addition to polyunsaturated omega-3 fatty acids, eicosapentaenoic acid (EPA), and docosahexaenoic acid (DHA). Eggs provide the most choline, and nuts and seeds

provide the most vitamin E. Soy products are a source of copper, manganese, and iron, as are legumes.

- The recommendation for protein foods in the Healthy U.S.-Style Eating Pattern at the 2,000-calorie level is 5½ ounce equivalents of protein foods per day.
- In addition to specific types of meat, foods such as eggs, nuts, seeds, and vegetables contain protein.
- When selecting protein foods, nuts and seeds should be unsalted, and meats and poultry should be consumed in lean forms.
- The inclusion of protein foods from plants allows vegetarian options to be accommodated.
- The dairy group contributes many nutrients, including calcium, phosphorus, vitamin A, vitamin D (in products fortified with vitamin D), riboflavin, vitamin B12, protein, potassium, zinc, choline, magnesium, and selenium.
- The recommended amounts of dairy in the Healthy U.S.-Style Pattern are based on age rather than calorie level.
- The recommended amounts of dairy for adults is 3 cup-equivalents per day.
- Individuals who are lactose intolerant can choose low-lactose and lactose-free dairy products.
- Most individuals in the United States would benefit by increasing dairy intake in fat-free or low-fat forms, whether from milk (including lactose-free milk), yogurt, and cheese or from fortified soy beverages (soymilk). Strategies to increase dairy intake include drinking fat-free or low-fat milk (or a fortified soy beverage) with meals, choosing yogurt as a snack, or using yogurt as an ingredient in prepared dishes such as salad dressings or spreads. Strategies for choosing dairy products in nutrient-dense forms include choosing lower-fat versions of milk, yogurt, and cheese in place of whole milk products and regular cheese.
- Patient menus should include offering more vegetables, fruits, whole grains, low-fat and fat-free dairy, and a greater variety of protein foods that are nutrient-dense, while also reducing sodium and added sugars, reducing saturated fats and replacing them with unsaturated fats, and reducing added refined starches.
- Those individuals responsible for developing patient menus should consider the range of offerings both within and across food groups and other dietary components

to determine whether the healthy options offered reflect the proportions in healthy eating patterns.

- To promote adequate nutrition and hydration among older adult patient populations within specific health care facilities such as assisted living facilities and nursing homes, health care administrators should: review residents' complaints and/or suggestions regarding food; ask residents how the offered food meets their preferences, allergies, intolerances, and/or medical needs; ensure menus offer diverse meal options; ensure regular mealtimes are offered; observe and evaluate their facilities' food safety methods; observe and determine whether relevant staff competently assists residents who use assistive devices; evaluate resident nutritional status and hydration; determine if relevant staff are effectively identifying concerns regarding a patient's/resident's nutritional/hydration status.

## *Adequate Personal Hygiene*

Another essential element to addressing and managing impaired skin integrity in older adult patient populations is adequate personal hygiene. Personal hygiene, as it relates to impaired skin integrity, may refer to a series of practices that sustain the body's cleanliness in order to maintain healthy skin integrity as well as overall health and well-being. Health care professionals should note that adequate personal hygiene can help prevent the spread of diseases among older adult patients. Important aspects of adequate personal hygiene, as it relates to impaired skin integrity, include the following: bathing regularly, water use, skin cleansing product use, and drying. Specific information regarding the aforementioned important aspects of adequate personal hygiene may be found below.

- ***Bathing regularly*** - bathing regularly can help prevent the spread of infections and diseases among adult patients. It can also have a positive psychological impact on older adult patients. Bathing regularly can help older adult patients: feel better about themselves, improve upon their self-esteem, improve self-image, feel more relaxed, maintain their dignity, and feel like they have a semblance of control over their health and well-being. With that last point in mind, health care professionals and health care administrators should note the following: patient bathing education, schedules, and routines should be kept at manageable levels to help older adults maintain their own personal hygiene, when applicable, in order to allow older adult patients a sense of personal independence.

- ***Water use*** - the use of water is a fundamental aspect of adequate personal hygiene. It has been argued that without the effective use of water there can be no adequate personal hygiene. With that said, effective water use in personal hygiene occurs

when water is used to clean the skin in a manner that does not jeopardize skin integrity and/or lead to or cause further impaired skin integrity. To ensure older adult patients are effectively using water when engaging in personal hygiene, health care professionals should encourage and educate patients to follow the three simple rules of effective water use. The three simple rules of effective water use may be found below.

- **Rule 1 of effective water use** - use warm water when engaging in personal hygiene rather than hot water or extremely hot water to reduce the risk of dehydrating the skin.
- **Rule 2 of effective water use** - do not bathe or shower for long periods of time to reduce the risk of dehydrating the skin and compromising skin integrity.
- **Rule 3 of effective water use** - do not over-clean. Over-cleaning the skin (e.g., bathing and/or showering to frequently and/or for excessive periods of time) may lead to itching, dryness, and compromised skin integrity. Health care professionals should note the following: itching and/or extensive itching can be detrimental to patient care as it relates to impaired skin integrity; itching and/or extensive itching can lead to excessive patient scratching, which in turn possess the potential to further skin irritation, damage, disruption, and loss of functionality; excessive skin scratching by a patient could open up wounds and or lead to infection(s); health care professionals should observe patients for signs of itching (e.g., scratch or nail marks on a patient's skin; skin irritation; localized skin irritation).

- ***Skin cleansing product use*** - the use of a skin cleansing product is another fundamental aspect of adequate personal hygiene. The term skin cleansing product may refer to any product designed to clean the human body while removing dirt, bacteria, dead skin cells, and/or other substances from the skin. Often soap-based products or plain soaps are used as skin cleansing products for personal hygiene (the term plain soap may refer to detergents that contain no added antimicrobial agents or may contain these solely as preservatives). Soap-based products and plain soaps clean the human body while removing dirt, bacteria, dead skin cells and/or other substances from the skin, however, they also possess the potential to disrupt the pH balance of the skin, cause further breakdown of the skin barrier, cause dryness, and lead to irritation. Thus, due to the potential of soap-based products and plain soaps to disrupt the pH balance of the skin, cause further breakdown of the skin barrier, cause dryness, and lead to irritation, they may not be the best choice for older adults suffering from impaired skin integrity or for older adults simply trying to

maintain their skin integrity. With that in mind, emollient-based soap substitutes and/or bath emollients may serve as an alternative to soap-based products and plain soaps.

Emollient-based soap substitutes and bath emollients are, typically, designed to remove dirt, bacteria, dead skin cells, and/or other substances from the skin, while avoiding skin barrier breakdown, dryness, and irritation. In other words, emollient-based soap substitutes and bath emollients are designed to promote skin integrity. Therefore, health care professionals and health care administrators should consider encouraging older adult patients to use emollient-based soap substitutes and/or bath emollients, when applicable. Health care professionals and health care administrators should note the following: it is important to consider patient preferences when selecting or determining which emollient-based soap substitutes and/or bath emollients may be used within health care facilities.

- ***Drying*** - drying, as it relates to skin integrity, may refer to the act of removing moisture and/or water from the body/skin after a personal hygiene routine, including water and a skin cleansing product, is completed (e.g., a traditional bath or shower). The act of drying the body and skin is essential to skin integrity because it can help individuals prevent and avoid maceration. Maceration, as it relates to impaired skin integrity, may refer to skin breakdown resulting from prolonged moisture. Health care professionals should note the following: older adult patients should be encouraged to pat or "gently" rub their skin when engaging in drying to help prevent related irritation and skin damage; older adult patients should be encouraged to use soft cloths to dry their skin in order to help prevent related irritation and skin damage. Health care administrators should consider providing soft cloths to older adult patients.

## *Skin Moisturizers*

Skin moisturizers may also be used to address and manage impaired skin integrity. A skin moisturizer may refer to a product designed to act as a barrier on the surface of the skin to help trap water and prevent water loss. Essentially, skin moisturizers help prevent skin drying and subsequent skin damage. Health care professionals should note that skin moisturizers may be available as an ointment, cream, or lotion. Health care professionals should also note the following: individuals may apply skin moisturizers after completing their personal hygiene routine.

## *Positioning and Mobilization*

Positioning and mobilization may be an option when addressing and managing pressure injuries. As previously mentioned, a pressure injury, also referred to as a pressure ulcer and/or bedsore, may refer to localized damage to the skin and/or underlying soft tissue, usually over a bony prominence. Pressure injuries typically result from intense and/or prolonged pressure due to immobility. Thus, patient positioning and mobilization may be used by health care professionals to help limit the damage associated with pressure injuries and/or to help prevent the occurrence of pressure injuries in high-risk patient populations (e.g., older adult patients). The key elements of positioning and mobilization include the following: repositioning at-risk patients, if not contraindicated; scheduling and planning patient repositioning, when applicable; the use of pressure-relieving devices (the term pressure-relieving device may refer to an appliance, which may be used to reduce pressure points caused by a patient's body weight when seated, bedridden or immobile); considerations regarding patient body size, level of immobility, exposure to shear, skin moisture and perfusion when choosing a support surface. Health care professionals should consider the aforementioned key elements when applying positioning and mobilization to patients at-risk or suffering from pressure injuries.

## *Antibiotics*

Some patients may require antibiotics to help address and manage their impaired skin integrity and/or any infections that may result from impaired skin integrity. Some of the more common antibiotics that may be used to address and manage impaired skin integrity and/or any infections that may result from impaired skin integrity include: amoxicillin/clavulanate, cephalexin, clindamycin, levofloxacin, doxycycline, Bactrim and vancomycin. Specific information regarding the aforementioned antibiotics may be found below.

### Amoxicillin/clavulanate

*Medication notes* - amoxicillin/clavulanate is an oral antibacterial combination consisting of the antibiotic amoxicillin and the ß-lactamase inhibitor, clavulanate potassium. Amoxicillin/clavulanate may be used in the treatment of skin and skin structure infections caused by ß-lactamase-producing strains of S. aureus, E. coli, and Klebsiella spp. Potential side effects of Amoxicillin/clavulanate include: nausea, vomiting, and diarrhea. Health care professionals should note the following: using amoxicillin/clavulanate in the absence of a proven or strongly suspected bacterial infection or a prophylactic indication is unlikely to provide benefit to the patient and increases the risk of the development of drug-resistant bacteria.

*Safety notes* - amoxicillin/clavulanate is contraindicated in patients with a history of allergic reactions to any penicillin. Amoxicillin/clavulanate is also contraindicated in patients with a previous history of cholestatic jaundice/hepatic dysfunction associated with amoxicillin/clavulanate. Warnings and precautions associated with amoxicillin/clavulanate include: serious and fatal hypersensitivity reactions have been reported, caution is advised; if an allergic reaction occurs, discontinue the medication; pseudomembranous colitis has been reported with nearly all antibacterial agents, including amoxicillin/clavulanate, and has ranged in severity from mild to life-threatening, therefore, it is important to consider this diagnosis in patients who present with diarrhea subsequent to the administration of antibacterial agents; treatment with antibacterial agents alters the normal flora of the colon and may permit overgrowth of clostridia; studies indicate that a toxin produced by Clostridium difficile is one primary cause of "antibiotic-associated colitis;" after the diagnosis of pseudomembranous colitis has been established, appropriate therapeutic measures should be initiated; mild cases of pseudomembranous colitis usually respond to drug discontinuation alone; in moderate to severe cases, consideration should be given to management with fluids and electrolytes, protein supplementation, and treatment with an antibacterial drug clinically effective against C. difficile colitis.

*Considerations for special patient populations* - amoxicillin/clavulanate should be used with caution in patients with evidence of hepatic dysfunction.

### Cephalexin

*Medication notes* - cephalexin is a cephalosporin antibiotic. Cephalexin may be used to treat skin and skin structure infections caused by Staphylococcus aureus and/or Streptococcus pyogenes as well as bone infections caused by Staphylococcus aureus and/or Proteus mirabilis. Cephalexin is administered orally. The typical adult dosage ranges from 1 to 4 g daily in divided doses. Side effects of cephalexin may include: nausea, vomiting, and diarrhea. Health care professionals should note that patient-related culture and susceptibility tests should be initiated prior to and during cephalexin therapy.

*Safety notes* - cephalexin is contraindicated in patients with a known allergy to the cephalosporin group of antibiotics. Warnings and precautions associated with cephalexin include: serious and fatal hypersensitivity reactions have been reported, caution is advised; any patient who has demonstrated some form of allergy, particularly to drugs, should receive antibiotics cautiously; if an allergic reaction occurs, discontinue the medication; Stevens-Johnson syndrome has been observed; pseudomembranous colitis has been reported with nearly all antibacterial agents, including cephalexin, and may range from mild to life-threatening, therefore, it is

important to consider this diagnosis in patients who present with diarrhea subsequent to the administration of antibacterial agents; treatment with antibacterial agents alters the normal flora of the colon and may permit overgrowth of clostridia; prolonged use of cephalexin may result in the overgrowth of nonsusceptible organisms; cephalosporins may be associated with a fall in prothrombin activity.

*Considerations for special patient populations* - cephalexin is known to be substantially excreted by the kidney, and the risk of toxic reactions to cephalexin may be greater in patients with impaired renal function such as older adult patients; older adult patients and/or older adult patients with impaired renal function should be monitored appropriately, when applicable.

### Clindamycin

*Medication notes* - clindamycin is an antibiotic that has activity against Gram-positive aerobes and anaerobes as well as -some Gram-negative anaerobes. Clindamycin is indicated in the treatment of serious infections caused by susceptible anaerobic bacteria. Clindamycin is also indicated in the treatment of serious infections due to susceptible strains of streptococci, pneumococci, and staphylococci. The typical adult dosage ranges from 150 - 450 mg every 6 hours. Specific dosages may depend on the seriousness of the infection. Potential side effects of clindamycin include: abdominal pain, pseudomembranous colitis, esophagitis, nausea, vomiting, and diarrhea.

*Safety notes* - clindamycin is contraindicated in patients with a history of hypersensitivity to preparations containing clindamycin or lincomycin. Warnings and precautions associated with clindamycin include: Clostridium difficile associated diarrhea (CDAD) has been reported with use of nearly all antibacterial agents, including clindamycin, and may range in severity from mild diarrhea to fatal colitis; treatment with antibacterial agents alters the normal flora of the colon, leading to overgrowth of C. difficile; clindamycin should not be used in patients with nonbacterial infections such as most upper respiratory tract infections; C. difficile produces toxins A and B, which contribute to the development of CDAD; hypertoxin producing strains of C. difficile cause increased morbidity and mortality, as these infections can be refractory to antimicrobial therapy and may require colectomy; CDAD must be considered in all patients who present with diarrhea following antibiotic use; careful medical history is necessary since CDAD has been reported to occur over two months after the administration of antibacterial agents; if CDAD is suspected or confirmed, ongoing antibiotic use not directed against C. difficile may need to be discontinued. Appropriate fluid and electrolyte management, protein supplementation, antibiotic treatment of C. difficile, and surgical evaluation should be instituted as clinically indicated.

*Considerations for special patient populations* - older adult patients with associated severe illness may not tolerate clindamycin-related diarrhea as well as other patient populations. Clindamycin should be used with caution in individuals with a history of gastrointestinal disease, particularly colitis.

### Levofloxacin

*Medication notes* - levofloxacin is a fluoroquinolone antibacterial indicated in adults (≥18 years of age) with infections caused by designated, susceptible bacteria. Levofloxacin may be used to treat complicated and uncomplicated skin and skin structure infections. Potential side effects of levofloxacin include: nausea, headache, diarrhea, constipation, and dizziness. Health care professionals should note the following: To reduce the development of drug-resistant bacteria and maintain the effectiveness of levofloxacin and other antibacterial drugs, levofloxacin should be used only to treat or prevent infections that are proven or strongly suspected to be caused by bacteria.

*Safety notes* - levofloxacin is contraindicated in patients with a history of hypersensitivity to levofloxacin. Warnings and precautions associated with levofloxacin include: risk of tendinitis and tendon rupture is increased; the aforementioned risk is further increased in older patients usually over 60 years of age, in patients taking corticosteroids, and in patients with kidney, heart or lung transplants; discontinue if pain or inflammation in a tendon occurs; anaphylactic reactions and allergic skin reactions, serious, occasionally fatal, may occur after first dose; hematologic (including agranulocytosis, thrombocytopenia), and renal toxicities may occur after multiple doses; severe, and sometimes fatal, hepatoxicity has been reported; discontinue immediately if signs and symptoms of hepatitis occur; central nervous system effects, including convulsions, anxiety, confusion, depression, and insomnia may occur after the first dose; use with caution in patients with known or suspected disorders that may predispose them to seizures or lower the seizure threshold; Clostridium difficile-associated colitis may occur; evaluate if diarrhea occurs; discontinue if peripheral neuropathy symptoms occur in order to prevent irreversibility; prolongation of the QT interval and isolated cases of torsade de pointes have been reported; avoid use in patients with known prolongation, those with hypokalemia, and with other drugs that prolong the QT interval.

*Considerations for special patient populations* - severe hepatotoxicity has been reported with levofloxacin; the majority of reports describe patients 65 years of age or older; older adults may have increased risk of tendinopathy (including rupture), especially with concomitant corticosteroid use; older adults may be more susceptible to prolongation of the QT interval.

## Doxycycline

*Medication notes* - doxycycline is an antibiotic that belongs to the medication class referred to as tetracycline antibiotics. The usual dose of oral doxycycline is 200 mg on the first day of treatment (administered 100 mg every 12 hours) followed by a maintenance dose of 100 mg/day. In the management of more severe infections, 100 mg every 12 hours may be recommended. Potential side effects of doxycycline include anorexia, nausea, vomiting, diarrhea, rash, photosensitivity, urticaria, and hemolytic anemia. Health care professionals should note the following: To reduce the development of drug-resistant bacteria and maintain the effectiveness of doxycycline, and other antibacterial drugs, should be used only to treat or prevent infections that are proven or strongly suspected to be caused by bacteria.

*Safety notes* - doxycycline is contraindicated in individuals who have shown hypersensitivity to any of the tetracyclines. Warnings and precautions associated with doxycycline include the following: Clostridium difficile-associated diarrhea may occur; evaluate patients if diarrhea occurs; photosensitivity manifested by an exaggerated sunburn reaction has been observed in some individuals taking tetracyclines; limit sun exposure; overgrowth of non-susceptible organisms, including fungi, may occur; reevaluate therapy if superinfection occurs.

*Considerations for special patient populations* - administration of doxycycline at the usual recommended dose does not result in excessive accumulation in patients with renal impairment. Dosage adjustment may not be necessary in patients with renal impairment.

## Sulfamethoxazole and trimethoprim (Bactrim)

*Medication notes* - Bactrim is a combination of sulfamethoxazole, a sulfonamide antimicrobial, and trimethoprim, a dihydrofolate reductase inhibitor antibacterial, indicated for infections caused by designated, susceptible bacteria. Potential side effects of Bactrim include: anorexia, nausea, and vomiting. Health care professionals should note the following: To reduce the development of drug-resistant bacteria and maintain the effectiveness of Bactrim and other antibacterial drugs, Bactrim should be used only to treat or prevent infections that are proven or strongly suspected to be caused by susceptible bacteria.

*Safety notes* - Bactrim is contraindicated in individuals with: a known hypersensitivity to trimethoprim or sulfonamides; a history of drug-induced immune thrombocytopenia with use of trimethoprim and/or sulfonamides; documented megaloblastic anemia due to folate deficiency; marked hepatic damage; severe renal insufficiency when renal function status cannot be monitored. Bactrim is also contraindicated with

concomitant administration with dofetilide. Warnings and precautions associated with Bactrim include: discontinue at the first appearance of skin rash or any sign of adverse reaction; monitor for hematologic toxicity; do not use for the treatment of group A beta-hemolytic streptococcal infections; Clostridium difficile associated diarrhea may occur; evaluate if diarrhea occurs; may cause allergic-type reactions.

*Considerations for special patient populations* - a reduced dosage of Bactrim should be used for patients with impaired renal function.

### Vancomycin

*Medication notes* - vancomycin is an antibiotic indicated for the treatment of serious or severe infections caused by susceptible strains of methicillin-resistant (ß-lactam-resistant) staphylococci; penicillin-allergic patients; patients who cannot receive or who have failed to respond to other drugs, including the penicillins or cephalosporins, and for infections caused by vancomycin-susceptible organisms that are resistant to other antimicrobial drugs. Vancomycin is effective in the treatment of staphylococcal endocarditis; other infections due to staphylococci, including bone infections as well as skin and skin structure infections. Health care professionals should note the following: To reduce the development of drug-resistant bacteria and maintain the effectiveness of vancomycin and other antibacterial drugs, vancomycin should be used only to treat or prevent infections that are proven or strongly suspected to be caused by susceptible bacteria; when culture and susceptibility information are available, they should be considered in selecting or modifying antibacterial therapy; in the absence of such data, local epidemiology and susceptibility patterns may contribute to the empiric selection of therapy. Health care professionals should note the following: infusion-related events are related to both the concentration and the rate of administration of vancomycin; concentrations of no more than 5 mg/mL and rates of no more than 10 mg/min, are recommended in adults; in selected patients in need of fluid restriction, a concentration up to 10 mg/mL may be used; use of such higher concentrations may increase the risk of infusion-related events; an infusion rate of 10 mg/min or less is associated with fewer infusion-related events. Health care professionals should also note the following: the usual daily intravenous dose is 2 g divided either as 500 mg every 6 hours or 1 g every 12 hours; each dose should be administered at no more than 10 mg/min or over a period of at least 60 minutes, whichever is longer; patient factors, such as age or obesity, may call for modification of the usual intravenous daily dose.

*Safety notes* - vancomycin is contraindicated in patients with a known hypersensitivity to vancomycin. Warnings and precautions associated with vancomycin include: rapid bolus administration (e.g., over several minutes) may be associated with exaggerated hypotension, including shock and rarely cardiac arrest; vancomycin for injection should

be administered in a diluted solution over a period of not less than 60 minutes to avoid rapid-infusion-related reactions; stopping a vancomycin infusion may result in prompt cessation of the aforementioned reactions; systemic vancomycin exposure may result in acute kidney injury; the risk of acute kidney injury increases as systemic exposure/serum levels increase; monitor renal function in all patients, especially patients with underlying renal impairment, patients with co-morbidities that predispose to renal impairment, and patients receiving concomitant therapy with a drug known to be nephrotoxic; ototoxicity has occurred in patients receiving vancomycin for injection; ototoxicity may be transient or permanent; ototoxicity has been reported mostly in patients who have been given excessive doses, who have an underlying hearing loss, or who are receiving concomitant therapy with another ototoxic agent, such as an aminoglycoside; vancomycin should be used with caution in patients with renal insufficiency because the risk of toxicity is appreciably increased by high, prolonged blood concentrations; dosage of vancomycin for injection must be adjusted for patients with renal dysfunction; Clostridium difficile associated diarrhea has been reported with use of nearly all antibacterial agents, including vancomycin hydrochloride for injection, and may range in severity from mild diarrhea to fatal colitis; treatment with antibacterial agents alters the normal flora of the colon leading to overgrowth of C. difficile; if Clostridium difficile associated diarrhea is suspected or confirmed, ongoing antibiotic use not directed against C. difficile may need to be discontinued; appropriate fluid and electrolyte management, protein supplementation, antibiotic treatment of C. difficile, and surgical evaluation should be instituted as clinically indicated; reversible neutropenia has been reported in patients receiving vancomycin for injection; patients who will undergo prolonged therapy with vancomycin for injection or those who are receiving concomitant drugs which may cause neutropenia should have periodic monitoring of the leukocyte count; vancomycin for injection is irritating to tissue and must be given by a secure IV route of administration; pain, tenderness, and necrosis occur with intramuscular (IM) injection of vancomycin for injection or with inadvertent extravasation; thrombophlebitis may occur, the frequency and severity of which can be minimized by administering the drug slowly as a dilute solution (2.5 to 5 g/L) and by rotation of venous access sites; measurement of vancomycin serum concentrations can be helpful in optimizing therapy, especially in seriously ill patients with changing renal function. Vancomycin serum concentrations can be determined by the use of microbiologic assay, radioimmunoassay, fluorescence polarization immunoassay, fluorescence immunoassay, or high-pressure liquid chromatography; Vancomycin-related monitoring should occur with patients.

*Considerations for special patient populations* - vancomycin dosage adjustment must be made in patients with impaired renal function; older adult patients may require greater dosage reductions than expected due to decreased renal function.

## Section 2 Summary

The following therapeutic options may be used to address and manage impaired skin integrity: adequate nutrition and hydration, adequate personal hygiene, skin moisturizers, positioning and mobilization and antibiotics. Health care professionals should be familiar with the aforementioned options to best serve older adult patients suffering from impaired skin integrity.

## Section 2 Key Concepts

- One of the most essential elements to addressing and managing impaired skin integrity in older adult patient populations is adequate nutrition and hydration.
- Adequate personal hygiene is essential to managing impaired skin integrity; important aspects of adequate personal hygiene, as it relates to impaired skin integrity, include the following: bathing regularly, water use, skin cleansing product use, and drying.
- Skin moisturizers may be used to address and manage impaired skin integrity.
- Positioning and mobilization may be an option when addressing and managing pressure injuries; the key elements of positioning and mobilization include the following: repositioning at-risk patients, if not contraindicated; scheduling and planning patient repositioning, when applicable; the use of pressure-relieving devices; considerations regarding patient body size, level of immobility, exposure to shear, skin moisture and perfusion when choosing a support surface.
- Some patients may require antibiotics to help address and manage their impaired skin integrity and/or any infections that may result from impaired skin integrity; antibiotics that may be used to address and manage impaired skin integrity and/or any infections that may result from impaired skin integrity include: amoxicillin/clavulanate, cephalexin, clindamycin, levofloxacin, doxycycline, Bactrim and vancomycin.

## Section 2 Key Terms

***Eating pattern*** - the combination of foods and beverages that constitute an individual's complete dietary intake over time; a customary way of eating or a combination of foods recommended for consumption

***Calorie balance*** - the balance between the calories taken in from foods and the calories expended from metabolic processes and physical activity

***Personal hygiene (as it relates to impaired skin integrity)*** - a series of practices that sustain the body's cleanliness in order to maintain healthy skin integrity as well as overall health and well-being

***Skin cleansing product*** - any product designed to clean the human body while removing dirt, bacteria, dead skin cells and/or other substances from the skin

***Plain soap*** - detergents that contain no added antimicrobial agents or may contain these solely as preservatives

***Emollient-based soap substitutes/bath emollients*** - products designed to remove dirt, bacteria, dead skin cells and/or other substances from the skin, while avoiding skin barrier breakdown, dryness, and irritation

***Drying (as it relates to skin integrity)*** - the act of removing moisture and/or water from the body/skin after a personal hygiene routine, including water and a skin cleansing product, is completed

***Maceration (as it relates to impaired skin integrity)*** - skin breakdown resulting from prolonged moisture

***Skin moisturizer*** - a product designed to act as a barrier on the surface of the skin to help trap water and prevent water loss

***Pressure-relieving device*** - an appliance, which may be used to reduce pressure points caused by a patient's body weight when seated, bedridden or immobile

## *Section 2 Personal Reflection Question*

What therapeutic options may be used to address and manage impaired skin integrity?

## *Case Study: Impaired Skin Integrity*

Impaired skin integrity-related case study is presented below to review the concepts found in this course. A case study review will follow the case study. The case study review includes the types of questions health care professionals should ask themselves when considering impaired skin integrity and how it relates to the administration of health care. Additionally, reflection questions will be posted, within the case study review, to encourage further internal debate and consideration regarding the presented case study and impaired skin integrity. The information found within the case study and case study review was derived from materials provided by the CDC, the Joint Commission, the National Council on Aging, the WHO, the U.S. Department of Health and Human Services and the FDA (CDC, 2020; Joint Commission, 2016;

National Council on Aging, 2020; WHO, 2020; U.S. Department of Health and Human Services, 2015; FDA, 2020).

## Case Study

An 86-year-old male patient is admitted to a long-term care facility. The patient has no know drug allergies and has a history of cardiovascular disease and depression. Upon examination, a health care professional observes, what appears to be, an area of irritated, reddish skin over the patient's tailbone. The aforementioned area of skin is intact, however, when the superficial reddening of the skin is pressed, it does not turn white. Upon further examination, the patient reveals that he is not experiencing an itching sensation and that he is, currently, "not in any more pain than usual." A Wong/Baker faces rating scale is used to determine that the patient's level/intensity of overall pain is a 4 out of 10. Additional patient questioning reveals that the patient has not been eating his "usual amount of food" and that he has not been "drinking a lot." The patient also reveals that he has been spending "a lot of time in bed lately" and that he has not been "bathing every day." The aforementioned, relevant, patient information is documented and the patient is brought to his room.

## Case Study Review

**What patient details may be relevant to impaired skin integrity?**

The following patient details may be relevant to impaired skin integrity: the patient is 86 years old; the patient has no know drug allergies; the patient has a history of cardiovascular disease and depression; a health care professional observes, what a appears to be, an area of irritated, reddish skin over the patient's tailbone; the aforementioned area of skin is intact, however, when the superficial reddening of the skin is pressed, it does not turn white; the patient reveals that he is not experiencing an itching sensation; the patient reveals that he is, currently, "not in any more pain than usual;" a Wong/Baker faces rating scale is used to determine that the patient's level/intensity of overall pain is a 4 out of 10; patient questioning, revels that the patient has not been eating his "usual amount of food" and that he has not been "drinking a lot;" the patient reveals that he has been spending "a lot of time in bed lately;" the patient reveals that he has not been "bathing every day;" relevant, patient information is documented.

*Are there any other patient details that may be relevant to impaired skin integrity; if so, what are they?*

**How are each of the aforementioned patient details relevant to impaired skin integrity?**

Each of the previously highlighted patient details may be potentially relevant to impaired skin integrity. The potential relevance of each patient detail may be found below.

The patient is 86 years old - the patient's age may be relevant because age is a potential risk factor for impaired skin integrity. Health care professionals should note the following: health care professionals should work to identify risk factors for impaired skin integrity when examining older adult patients. Health care professionals should also note the following risk factors for impaired skin integrity: pressure, trauma, moisture, an injury involving the skin, immobility, poor nutrition, poor hydration, inadequate hygiene, impaired mental status, and age.

The patient has no know drug allergies - the previous patient detail may be relevant to health care professionals when they are working to address and manage possible impaired skin integrity, especially if antibiotics are required.

The patient has a history of cardiovascular disease and depression - the previous patient detail may be relevant because it provides context for the patient's possible impaired skin integrity. Furthermore, the patient's history of depression may provide insight into the patient's reported, recent eating/hydrating habits. The patient's history of depression may also provide insight into why the patient has been spending "a lot of time in bed lately." Health care professionals should note the following information regarding cardiovascular disease: chronic diseases, such as cardiovascular disease, reduce the skin's ability to repair damage.

A health care professional observes, what a appears to be, an area of irritated, reddish skin over the patient's tailbone - the aforementioned patient detail may be relevant because it may be an indication of impaired skin integrity - specifically, it may indicate the presence of a pressure injury. Health care professionals should note the following: a pressure injury, also referred to as a pressure ulcer or bedsore, may refer to localized damage to the skin and/or underlying soft tissue, usually over a bony prominence; pressure injuries typically result from intense and/or prolonged pressure; a pressure injury can present as intact skin or an open ulcer; pressure injuries typically affect high-risk patient populations such as older adults.

The aforementioned area of skin is intact, however, when the superficial reddening of the skin is pressed, it does not turn white - the aforementioned patient detail may be relevant because it may provide further indication of impaired skin integrity/ it may indicate the presence of a pressure injury. The aforementioned patient detail may also be relevant because it may help health care professionals identify the stage or type of pressure injury. Health care professionals should note the following: Stage 1 pressure injuries are characterized by intact skin with a localized area of non-

blanchable erythema (i.e., stage 1 pressure injuries are characterized by a superficial reddening of the skin that, when pressed, does not turn white); Stage 2 pressure injuries are characterized by partial-thickness skin loss with exposed dermis; a Stage 2 pressure injury wound bed is typically viable, pink or red, moist, and may represent as an intact or ruptured serum-filled blister; adipose (fat) is not visible and deeper tissues are not visible; granulation tissue, slough and eschar are not present; Stage 3 pressure injuries are characterized by full-thickness loss of skin, in which adipose (fat) is visible in the ulcer and granulation tissue and epibole are often present; slough and/or eschar may be visible; the depth of tissue damage varies by anatomical locations; areas of significant adiposity can develop deep wounds; undermining and tunneling may occur; fascia, muscle, tendon, ligament, cartilage and/or bone are not exposed; Stage 4 pressure injuries are characterized by full-thickness skin and tissue loss with exposed or directly palpable fascia, muscle, tendon, ligament, cartilage or bone in the ulcer; slough and/or eschar maybe visible; epibole, undermining and/or tunneling often occur; depth varies by anatomical location.

The patient reveals that he is not experiencing an itching sensation - the previous patient detail is relevant to a patient assessment regarding impaired skin integrity. Health care professionals should note the following: health care professionals should observe patients for signs of itching when conducting patient assessments (e.g., scratch or nail marks on a patients skin; skin irritation; localized skin irritation); itching and/or extensive itching can be detrimental to patient care as it relates to impaired skin integrity; itching and/or extensive itching can lead to excessive patient scratching, which in turn possess the potential to further skin irritation, damage, disruption, and loss of functionality; excessive skin scratching by a patient could open up wounds and or lead to infection(s); those patients who are experiencing itching and/or extensive itching should be counseled on the detrimental effects of excessive scratching; those patients should also be observed and routinely monitored.

The patient reveals that he is, currently, "not in any more pain than usual" - the previous patient detail is also relevant to a patient assessment regarding impaired skin integrity. Health care professionals should note the following: health care professionals should evaluate a patient's level of pain and discomfort when conducting patient assessments related to impaired skin integrity; pain is often associated with impaired skin integrity.

A Wong/Baker faces rating scale is used to determine that the patient's level/intensity of overall pain is a 4 out of 10 - the aforementioned patient detail may be relevant because it provides insight into the patient's level/intensity of overall pain. Health care professionals should note the following: health care professionals may evaluate a patient's pain and related discomfort by using a variety of pain assessment tools which

include: a simple numerical pain intensity scale, the WILDA approach assessment guide, the Wong/Baker faces rating scale, the Critical-Care Pain Observation Tool (CPOT), and the Pain Assessment in Advanced Dementia (PAINAD) scale; health care professionals should select a pain assessment tool based on individual patient needs and characteristics.

Patient questioning reveals that the patient has not been eating his "usual amount of food" and that he has not been "drinking a lot" - the previous patient details may be relevant because poor nutrition and poor hydration are potential risk factors for impaired skin integrity.

The patient reveals that he has been spending "a lot of time in bed lately" - the previous patient detail may be relevant because immobility is a potential risk factor for impaired skin integrity - specifically, immobility is a potential risk factor for pressure injuries.

The patient reveals that he has not been "bathing every day" - the previous patient detail may be relevant because inadequate hygiene is a potential risk factor for impaired skin integrity.

The patient information is documented - the previous detail is relevant because health care documentation is an essential element of adequate patient assessments regarding impaired skin integrity. Health care professionals should note the following: health care professionals should complete health care documentation when assessing patient-related impaired skin integrity; when completing health care documentation centered around patient impaired skin integrity, health care professionals should include information relevant to the patient, patient's impaired skin integrity, and relevant information related to essential elements of an adequate impaired skin integrity patient assessment, which include: etiology determination, nutritional and hydration status determination, mobility determination, impaired tissue integrity/ condition, wound characteristics, recognition of high-risk areas, pressure injury evaluation, signs of itching, patient pain and discomfort, patient vital signs, patient management goals; health care documentation may be vital to addressing impaired skin integrity.

*What other ways, if any, are the previous patient details relevant to impaired skin integrity?*

**Is the patient in the above case study suffering from impaired skin integrity?**

Based on the information presented in the case study, it does appear that the patient is suffering from impaired skin integrity - specifically, it appears the patient is suffering from a Stage 1 pressure injury?

*How can health care professionals differentiate the stages or types of pressure injuries?*

**What management goals, regarding impaired skin integrity, should be set for the patient?**

The team of health care professionals caring for the patient should set both short-term goals and long-term goals for the patient. Specific patient management goals, regarding impaired skin integrity, may include the following: continue to assess patient-related impaired skin integrity; continue to assess high-risk areas such as areas of the skin that cover the shoulders, elbows, knees, as well as the tailbone and hip bones; observe, monitor and evaluate pressure injuries; assess the overall condition of the patient's skin; observe and monitor patient signs of itching such as scratch or nail marks on the patients skin, skin irritation and/or localized skin irritation; observe and monitor patient pain and discomfort; observe and monitor patient vital signs; observe and monitor the site of impaired skin integrity at least once daily for color changes, redness, swelling, pain, or other signs of infection; observe and monitor the skin around the area of impaired skin integrity; address the impaired skin integrity as needed; improve and/or maintain adequate patient nutrition; improve and/or maintain adequate patient hydration; improve and/or maintain adequate patient personal hygiene; address patient mobility or lack of mobility; ensure patient skin remains in tack; educate the patient regarding adequate skin care; educate the patient regarding adequate hydration and nutrition; educate the patient regarding adequate personal hygiene; work to prevent further and/or additional patient-related impaired skin integrity.

*Are there any other management goals that should be set for the patient; if so, what are they?*

**What professional skills/tools should health care professionals employ while addressing the patient's impaired skin integrity?**

The following professional skills/tools should be employed by health care professionals while addressing the patient's impaired skin integrity: observation/ patient monitoring, health care documentation, effective hand hygiene, personal protective equipment (PPE), aseptic dressing techniques, when applicable, fall precautions, and health care organization policies and procedures.

*Are there any other professional skills/tools that should be employed while addressing the patient's impaired skin integrity; if so, what are they?*

**How should health care professionals address/manage the patient's impaired skin integrity?**

To effectively address/manage the patient's impaired skin integrity, the health care professionals involved in the patient's care should utilize relevant therapeutic options such as adequate nutrition and hydration, adequate personal hygiene, skin moisturizers, positioning, and mobilization, and antibiotics, when applicable.

*Are there any other therapeutic options available to effectively address/manage the patient's impaired skin integrity; if so, what are they?*

**How may health care professionals utilize each of the aforementioned therapeutic options to address/manage the patient's impaired skin integrity?**

Health care professionals may utilize the aforementioned therapeutic options in a variety of ways to address/manage patients' impaired skin integrity. Examples of how health care professionals may utilize each of the aforementioned therapeutic options to address/manage the patient's impaired skin integrity, from the case study, may be found below.

Adequate nutrition and hydration - health care professionals can ensure the patient receives adequate nutrition/hydration per day (e.g., 2 - 2.5 liters of fluid per day, unless the patient becomes medically restricted; 2,000 calories per day, unless the patient requires additional calories due to activity).

Adequate personal hygiene - health care professionals can ensure the patient engages inadequate personal hygiene (e.g., bathes regularly; use warm water when engaging in personal hygiene rather than hot water or extremely hot water; does not over-clean; uses emollient-based soap substitutes and/or bath emollients; uses soft cloths to dry).

Skin moisturizers - health care professionals can ensure the patient applies skin moisturizers, when applicable, to help prevent dry skin.

Positioning and mobilization - health care professionals can employ the key elements of positioning and mobilization, which include the following: repositioning at-risk patients, if not contraindicated; scheduling and planning patient repositioning, when applicable; the use of pressure-relieving devices (the term pressure-relieving device may refer to an appliance, which may be used to reduce pressure points caused by a patient's body weight when seated, bedridden or immobile); considerations regarding patient body size, level of immobility, exposure to shear, skin moisture and perfusion when choosing a support surface.

Antibiotics - health care professionals can assess the need for antibiotics. Health care professionals should note the following antibiotics may be used to help address and manage impaired skin integrity and/or any infections that may result from impaired skin integrity: amoxicillin/clavulanate, cephalexin, clindamycin, levofloxacin, doxycycline, Bactrim and vancomycin. Health care professionals should be familiar with the aforementioned antibiotics.

*How can health care professionals evaluate the effectiveness of each therapeutic option utilized to address/manage impaired skin integrity?*

## Conclusion

Impaired skin integrity may refer to relatively unhealthy skin that can show damage, disruption, loss of functionality, and/or may not be intact. Impaired skin integrity may lead to infection, impaired mobility, loss of functionality, loss of limb(s) as well as decreased health, overall well-being, quality of life, and even death. Thus, the presence of impaired skin integrity is a major concern for older adult patients. With that said, health care professionals should adequately identify, evaluate, and assess older adult patients suffering from impaired skin integrity by conducting an adequate patient assessment. An adequate patient assessment, as it relates to the presence of impaired skin integrity, is one that safely and effectively identifies impaired skin integrity, while attempting to determine the potential cause, type, intensity, pain and related complications associated with impaired skin integrity. Health care professionals should note that impaired skin integrity-related patient assessments may occur at any point in the health care process and may be used to both identify and monitor impaired skin integrity. Health care professionals should also note that an adequate patient assessment regarding impaired skin integrity may include the following elements: etiology determination, nutritional and hydration status determination, mobility determination, impaired tissue integrity/condition, wound characteristics, recognition of high-risk areas, pressure injury evaluation, signs of itching, patient pain, patient vital signs, patient management goals, and health care documentation.

An adequate patient assessment is essential to addressing and managing impaired skin integrity. The professional skills and tools health care professionals should employ while addressing impaired skin integrity include: observation/patient monitoring, health care documentation, effective hand hygiene, personal protective equipment (PPE), aseptic dressing techniques, fall precautions, and health care organization

policies and procedures. Health care professionals should note that the following therapeutic options may be used to address and manage impaired skin integrity: adequate nutrition and hydration, adequate personal hygiene, skin moisturizers, positioning and mobilization, and antibiotics. Finally, health care professionals should be familiar with the aforementioned therapeutic options to best serve older adult patients in need.

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