



**APTA's Section On Clinical  
Electrophysiology and Wound Management  
Guide for Integumentary/Wound  
Management Content in Professional  
Physical Therapist Education**

# Integumentary Content Recommendations for Professional Physical Therapist Curricula

## Foundational Sciences Matrix

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
<b>Normal Tissue Healing – Anatomy, Physiology, and Influencing Factors</b>			
<p>Anatomy of the skin</p> <ul style="list-style-type: none"> <li>• Function of the skin</li> <li>• Layers of the skin, including primary cells and vascular supply</li> </ul> <p>Physiology of healing</p> <ul style="list-style-type: none"> <li>• Activation of platelets and the process of hemostasis</li> <li>• Normal physiology of tissue healing, including the phases of healing</li> <li>• Types of wound closure</li> </ul> <p>Factors that can affect tissue healing</p> <ul style="list-style-type: none"> <li>• Systemic factors</li> <li>• Local factors</li> </ul>	<ul style="list-style-type: none"> <li>• Identify complications that may result from skin loss</li> <li>• Explain the structure and function of dermal appendages and their benefit in wound closure</li> <li>• Describe the depth of tissue damage using relevant terms</li> <li>• Explain the role and function of cells primarily involved in tissue healing</li> <li>• Identify the important aspects associated with the phases of normal wound healing including wound closure and ultimate healing</li> <li>• Discuss the clinical significance of general systemic and local factors that can impede tissue healing</li> <li>• Describe how diabetes mellitus specifically can impair healing</li> </ul>	<ul style="list-style-type: none"> <li>• Describe the functions of skin</li> <li>• Identify structural components of the skin</li> <li>• Define terms associated with wound depth, including superficial, partial thickness, and full thickness</li> <li>• Describe the function of cells primarily active in tissue healing including platelets, fibroblasts, myofibroblasts, mast cells, macrophages, and neutrophils</li> <li>• Describe the process of hemostasis</li> <li>• Describe the phases of tissue healing including hemostasis, inflammation, proliferation, epithelialization, and remodeling</li> <li>• Define the types of wound closure including primary intention, secondary intention, and delayed primary intention</li> <li>• Describe and understand systemic factors that can impede tissue healing including co-morbidities               <ul style="list-style-type: none"> <li>○ Nutrition/hydration</li> <li>○ Diabetes mellitus</li> <li>○ Peripheral vascular disease</li> <li>○ Gastroesophageal reflux disease (GERD)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Describe areas of integumentary interruption by level of wound depth</li> <li>• Identify primary phase of healing based on identifiable soft tissue characteristics</li> <li>• Discuss and/or identify the overlapping stages of wound healing visible in an open wound</li> <li>• Identify the method(s) of wound closure in various actual or case based wounds</li> <li>• Provide patient/client education regarding how factors that may impede tissue healing can be altered</li> <li>• Educate patient/client regarding the significance of glucose control on soft tissue healing</li> </ul>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
		<ul style="list-style-type: none"> <li>○ Collagen disease</li> <li>○ End-stage renal disease</li> <li>○ Immunosuppression</li> <li>○ Aging</li> <li>○ Medications</li> <li>○ Social/health habits</li> <li>○ Functional status and activity level</li> <li>○ Infection</li> <li>○ Paresthesia</li> <li>○ Perfusion</li> <li>○ Incontinence</li> <li>○ Psychological function (eg stress, memory, anxiety)</li> <li>● Describe and understand local factors that can impede tissue healing including <ul style="list-style-type: none"> <li>○ Hypergranulation</li> <li>○ Perfusion/oxygenation <ul style="list-style-type: none"> <li>○ tobacco use</li> </ul> </li> <li>○ Infection</li> <li>○ Edema</li> <li>○ Pressure/friction/shear</li> <li>○ Moisture (maceration)</li> <li>○ Sensation/neuropathy</li> <li>○ Hyperkeratosis</li> <li>○ Epibole</li> <li>○ Cellulitis</li> <li>○ Nonviable tissue</li> <li>○ Lack of growth factors</li> <li>○ Cytokines</li> <li>○ Matrixmetalloproteases (MMPs)</li> </ul> </li> <li>● Tissue inhibitors of MMPs</li> </ul>	

## Clinical Sciences Matrix

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
<b>Psychosocial Issues</b>			
Possible concerns <ul style="list-style-type: none"> <li>• Quality of life issues</li> <li>• Effects of isolation</li> <li>• Cosmesis and self image</li> <li>• Effects of chronic illness</li> <li>• Caregiver stress</li> <li>• Health care expenses and lost wages</li> <li>• Occupational and lifestyle changes</li> <li>• Social habits</li> <li>• Palliative care</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss the various psychological issues involved in wound management</li> <li>• Discuss the role of stress on overall wound healing</li> </ul>	<ul style="list-style-type: none"> <li>• Based on mock patient/client scenarios, discuss possible psychological issues patients/clients might encounter in cases of traumatic amputation, facial burns, or odiferous wounds associated with terminal cancer</li> <li>• Identify possible effects of chronic illness including stress, anger, depression, financial stress, isolation, and dependence on a patient's/client's ability to deal with open wounds</li> <li>• Discuss possible roles of the physical therapist in palliative care for a patient/client with an open wound</li> <li>• Discuss how to address goals within the plan of care in cases of palliative care</li> <li>• Identify sources of support including referral to other health professionals and/or community organizations</li> </ul>	<ul style="list-style-type: none"> <li>• Identify possible psychological complications present in a patient/client with traumatic injury</li> <li>• Identify potential local sources of support for patients/clients dealing with psychological issues</li> </ul>
<b>Examination</b>			
Patient/Client history <ul style="list-style-type: none"> <li>• General demographics including age, height, weight</li> <li>• Social history including culture, resources, activities, and support systems</li> <li>• Employment/work (job/school/play)</li> <li>• Growth and development</li> <li>• Living environment and discharge destination</li> <li>• General health status and function including physical,</li> </ul>	<ul style="list-style-type: none"> <li>• Explain the significance and role of patient/client general, family, and social information on accurate examination, evaluation, diagnosis and prognosis (including plan of care)</li> </ul>	<ul style="list-style-type: none"> <li>• Identify benefits to understanding the history of a patient's/client's current illness</li> <li>• Discuss issues surrounding the patient's/client's level of function and mobility and how these factors can influence wound healing potential</li> <li>• Determine critical general, family, social, and wound factors when planning for discharge</li> <li>• Discuss the importance of date of onset and mechanism of injury in determining therapeutic interventions</li> <li>• Explain how aspirin and other anticoagulant use by a patient/client can influence intervention choices</li> </ul>	<ul style="list-style-type: none"> <li>• Perform a thorough subjective examination collecting pertinent general, family, social, and soft tissue injury historical information</li> <li>• Inform patient/client about behavioral health risks (eg, tobacco and alcohol use) and how these can delay healing</li> <li>• Determine whether a wound is in the acute, subacute, or chronic state based on actual</li> </ul>

<b>Primary Content</b>	<b>Terminal Behavioral Objectives</b> <b>After the completion of the content, the student will be able to...</b>	<b>Example Instructional Objectives for the Classroom</b>	<b>Example Instructional Objective for the Clinic</b>
<p>psychological, and social</p> <ul style="list-style-type: none"> <li>• Family history</li> <li>• Social habits and behavioral health risks including tobacco, alcohol, drug abuse, and fitness</li> <li>• Past medical/surgical history including, cardiovascular endocrine/metabolic, gastrointestinal, genitourinary, previous wounds/dermatologic conditions, musculoskeletal, neuromuscular, and prior hospitalizations</li> <li>• Current condition(s)/chief complaint(s) including patient/client needs, concerns, current and prior wound interventions</li> <li>• Injury/disease including onset, mechanism, course of events, symptoms, and patient/client or family/caregiver expectations and goals</li> <li>• Functional status and activities of daily living (ADLs)</li> <li>• Medications including steroids, antibiotics, anticoagulants, chemotherapy, radiation, insulin, nonsteroidal anti-inflammatory drugs (NSAIDS), analgesics, herbals, and home remedies</li> </ul>			<p>or mock subjective information</p> <ul style="list-style-type: none"> <li>• Determine if a patient's/client's current medications prevent him/her from participating in physical therapy or receiving a particular intervention</li> <li>• Review a patient's/client's complete history and identify factors that could negatively and positively affect the patient's/client's prognosis for rehabilitation</li> <li>• Recommend discharge plans for a patient/client based on general, family, social, and tissue healing information</li> </ul>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
<b>Systems Review</b>			
<p>Gross screening of general systems</p> <ul style="list-style-type: none"> <li>• Cardiovascular/Pulmonary</li> <li>• Integumentary</li> <li>• Musculoskeletal</li> <li>• Neuromuscular</li> </ul> <p>Impaired integumentary system would lead to tests and measures</p>	<ul style="list-style-type: none"> <li>• Discuss how abnormal vital signs may impact tissue healing potential</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate skill in performing basic systems review testing including <ul style="list-style-type: none"> <li>○ Blood pressure</li> <li>○ Heart rate</li> <li>○ Respiratory rate</li> <li>○ Gross strength</li> <li>○ Gross symmetry</li> <li>○ Gross motor function</li> </ul> </li> <li>• Demonstrate skill in performing basic systems review via visual screening including <ul style="list-style-type: none"> <li>○ Presence of edema</li> <li>○ Presence of scar tissue</li> <li>○ Gross symmetry</li> <li>○ Gross motor function</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate correct technique in obtaining basic vital sign information</li> <li>• Perform a gross screen to assess a patient's overall general strength</li> </ul>
<b>Integumentary Tests and Measures</b>			
<p>Wound characteristics</p> <ul style="list-style-type: none"> <li>• Wound dimensions including surface area (SA) and depth</li> <li>• Wound bed/margins including tissue type, color, quality, presence of anatomical structures, and phase of healing</li> <li>• Drainage/exudate including type, amount, consistency and odor</li> <li>• Classifications including etiology and wound type, depth of tissue destruction, tissue color, and infection</li> <li>• Photodocumentation</li> </ul>	<ul style="list-style-type: none"> <li>• Describe methods of measuring wound surface area and depth</li> <li>• Identify and determine the quality of various tissue types/anatomical structures present within wounds</li> <li>• Describe wound drainage/exudate characteristics as related to wound status</li> <li>• Utilize classification models including wound type, depth, and tissue color in determining wound status</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss the differences between the Rule of Nines and the Lund and Browder methods of determining the amount of surface area involved in burn wounds</li> <li>• Discuss different methods of recording wound surface area and depth including <ul style="list-style-type: none"> <li>○ Clock method of length (12 to 6 o'clock) and width (3-9 o'clock)</li> <li>○ Perpendicular method (longest length x longest width)</li> <li>○ Deepest wound base</li> <li>○ Extent of tracks, tunnels, and undermining (clock method)</li> <li>○ Photographs</li> <li>○ Wound tracings</li> <li>○ Digitization</li> </ul> </li> <li>• Determine status of exposed, identified tissues and anatomical structures including <ul style="list-style-type: none"> <li>○ Adipose tissue</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate and/or discuss technique of documenting wound surface area using the clock method of measurement</li> <li>• Discuss and/or identify normal and abnormal appearance and quality of exposed tendon and granulation tissue in open wounds</li> <li>• Evaluate and/or discuss wound drainage characteristics and relate to wound status</li> <li>• Utilize published photodocumentation or current patient/client cases to compare and contrast wound</li> </ul>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
		<ul style="list-style-type: none"> <li>○ Blood vessels</li> <li>○ Bone</li> <li>○ Fascia</li> <li>○ Granulation tissue</li> <li>○ Muscle</li> <li>○ Nonviable/necrotic tissue</li> <li>○ Slough</li> <li>○ Tendon</li> <li>● Discuss the process of examining wound drainage/exudate based on <ul style="list-style-type: none"> <li>○ Type <ul style="list-style-type: none"> <li>▪ serous</li> <li>▪ serosanguineous</li> <li>▪ sanguineous</li> <li>▪ purulent</li> </ul> </li> <li>○ Amount <ul style="list-style-type: none"> <li>▪ none</li> <li>▪ scant</li> <li>▪ min</li> <li>▪ mod</li> <li>▪ copious</li> </ul> </li> <li>○ Consistency <ul style="list-style-type: none"> <li>▪ viscous</li> <li>▪ watery</li> <li>▪ mucinous</li> </ul> </li> <li>○ Odor <ul style="list-style-type: none"> <li>▪ none</li> <li>▪ foul</li> <li>▪ putrid</li> </ul> </li> </ul> </li> <li>● Discuss tissue classification models including <ul style="list-style-type: none"> <li>○ Pressure ulcer staging</li> <li>○ Wagner's</li> <li>○ University of Texas classification for diabetic foot ulcers</li> <li>○ Clinical, etiology, anatomic,</li> </ul> </li> </ul>	<p>characteristics demonstrated during normal phases of healing</p>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
		pathophysiological classification system (CEAP) <ul style="list-style-type: none"> <li>○ Red, black, yellow tissue color</li> </ul> <ul style="list-style-type: none"> <li>• Discuss the benefits and challenges associated with photodocumentation</li> </ul>	
Pressure risk assessments <ul style="list-style-type: none"> <li>• Braden, Norton, and Gosnell</li> </ul> Vascular testing <ul style="list-style-type: none"> <li>• doppler ultrasound, ankle brachial index (ABI), LEA, and digital photoplethysmography (D-PPG)</li> </ul> Neuropathic testing <ul style="list-style-type: none"> <li>• Wagner and Semmes</li> <li>• Weinstein Monofilament</li> </ul>	<ul style="list-style-type: none"> <li>• Identify factors that predict risk of developing pressure ulcers</li> <li>• Describe the technique and significance of Doppler ultrasound and ankle brachial index (ABI) in establishing vascular status</li> <li>• Describe the technique when utilizing a monofilament to assess protective sensation of the foot</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss the relevance of risk assessment scales and tests such as Braden, Doppler ultrasound, ankle brachial index, and Wagner</li> <li>• Determine which scales are relevant for specific wound types</li> </ul>	<ul style="list-style-type: none"> <li>• Determine a patient's/client's ability for bed mobility and pressure relief while in bed</li> </ul>
Examination of Periwound Tissue <ul style="list-style-type: none"> <li>• Callus</li> <li>• Erythema</li> <li>• Excoriation</li> <li>• Fungal infections</li> <li>• Hemosiderin staining</li> <li>• Hyperkeratosis</li> <li>• Induration</li> <li>• Maceration</li> <li>• Scale</li> <li>• Scarring</li> <li>• Xerosis</li> <li>• Edema</li> <li>• Tenderness to palpation</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss wound management interventions relevant to the treatment of periwound tissue</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss potential difficulties in identifying erythema in darkly pigmented skin</li> <li>• Discuss the meaning of induration including etiology and how it can be a sign of infection</li> <li>• Explain the negative effects of maceration</li> <li>• Relate wound type and hemosiderin staining</li> <li>• Describe the mechanism behind callus formation and the benefits of saucerization, especially in patients/clients with diabetes mellitus</li> <li>• Compare and contrast scar tissue and healthy, normal skin including strength, mobility, vascular supply, and function</li> </ul>	<ul style="list-style-type: none"> <li>• Assess skin characteristics surrounding an open wound or other area of soft tissue injury and identify instances of erythema, induration, callus, and/or scarring</li> <li>• Provide patient/client education regarding the cause and associated negative aspects of maceration and adjust the plan of care to prevent continuation of maceration</li> <li>• Provide patient/client education regarding the mechanism and significance of hemosiderin staining</li> </ul>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
<p>Infection</p> <ul style="list-style-type: none"> <li>• Signs of critical colonization</li> <li>• Signs and symptoms of infection</li> <li>• Local versus systemic infection</li> <li>• Types of infection including cellulitis, lymphangitis, sepsis and osteomyelitis</li> <li>• Tests and measures to identify infection</li> <li>• Bioburden</li> </ul>	<ul style="list-style-type: none"> <li>• Recognize and differentiate the signs and symptoms of critical colonization and infection</li> <li>• Differentiate between signs of infection and inflammation</li> </ul>	<ul style="list-style-type: none"> <li>• Recognize the following as possible signs and symptoms of infection <ul style="list-style-type: none"> <li>○ Abnormal lab values</li> <li>○ Edema</li> <li>○ Erythema</li> <li>○ Fever</li> <li>○ Friable granulation tissue</li> <li>○ Increased drainage</li> <li>○ Induration</li> <li>○ Increased pain</li> <li>○ Increased glucose levels in patients/clients with diabetes mellitus</li> <li>○ Increased local temperature</li> <li>○ Odor after irrigation</li> </ul> </li> <li>• Based on mock patient/client scenarios, determine whether specific signs and symptoms listed above are most likely related to infection or other etiology</li> <li>• Given specific patient/client case information, determine which test(s)/measure(s) would be most effective <ul style="list-style-type: none"> <li>○ Laboratory tests</li> <li>○ Radiographic tests</li> <li>○ Wound biopsy</li> <li>○ Wound culture</li> </ul> </li> <li>• Discuss the differences between contamination, colonization, critical colonization, and infection</li> </ul>	<ul style="list-style-type: none"> <li>• Provide patient/client education regarding the signs and symptoms of infection</li> <li>• Visually inspect the integument to identify signs and symptoms of infection in a patient/client and determine whether these signs are related to infection or normal inflammation</li> <li>• Discuss alternative (ie lab findings) tests/measures for determining infection in specific patient/client situations</li> </ul>
<p>Infection control measures</p> <ul style="list-style-type: none"> <li>• Sterile versus clean technique</li> <li>• Standard precautions</li> <li>• Isolation</li> <li>• Hand washing</li> <li>• Infections</li> <li>• Cleaning and disinfection of equipment</li> <li>• Aerosolization risks with</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss the need for and use of infection control measures</li> <li>• Identify the different levels of isolation and discuss the protective measures associated with each</li> </ul>	<ul style="list-style-type: none"> <li>• Determine personal protective equipment necessary for each level of isolation</li> <li>• Discuss potential for aerosolization for different methods of hydrotherapy/irrigation and low frequency US devices and for risk reduction</li> <li>• Demonstrate proper technique for don/doff of sterile gloves</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate universal precautions when working with patients/clients</li> <li>• Don/doff personal protective equipment dependent upon patient/client isolation status</li> <li>• Dedicate equipment to patients/clients with isolation</li> </ul>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
irrigation and low frequency US devices			precautions
Dressings and debridement interventions for infection <ul style="list-style-type: none"> <li>• Antimicrobial dressings</li> <li>• Inappropriate solutions including hydrogen peroxide and povidone-iodine</li> <li>• Inappropriate use of occlusive dressings when there is infection</li> <li>• Precautionary use of acetic acid and Dakin's solution</li> <li>• Debridement to decrease potential/current wound infection</li> </ul>	<ul style="list-style-type: none"> <li>• Determine dressings to use on infected wounds</li> <li>• Based on wound characteristics, determine the need for debridement</li> </ul>	<ul style="list-style-type: none"> <li>• Identify dressings that contain antimicrobial/antibacterial factors</li> <li>• Based on mock patient/client scenarios, determine the type of dressing would be most effective for infected wounds</li> </ul>	<ul style="list-style-type: none"> <li>• Provide an actual or mock plan of care including dressing choice and debridement (if necessary) to help manage a patient's/client's local wound infection</li> </ul>
Sensory integrity <ul style="list-style-type: none"> <li>• Deep pressure</li> <li>• Light touch</li> <li>• Kinesthesia</li> <li>• Position sense</li> <li>• Protective sensation</li> <li>• Sharp/dull</li> <li>• Temperature</li> <li>• Vibration</li> </ul>	<ul style="list-style-type: none"> <li>• Perform relevant noninvasive sensory integrity tests and measures</li> </ul>	<ul style="list-style-type: none"> <li>• Perform tests and measures for light touch utilizing a cotton ball and a monofilament</li> <li>• Perform tests and measures of graphesthesia, stereognosis, and vibration on classmates</li> </ul>	<ul style="list-style-type: none"> <li>• Determine protective sensation on a patient/client with diabetes mellitus using a monofilament</li> <li>• Test sharp/dull sensation on a patient/client</li> </ul>
Pain specific to open wounds <ul style="list-style-type: none"> <li>• Impact on function</li> <li>• Related pain interventions</li> </ul>	<ul style="list-style-type: none"> <li>• Determine wound related pain interventions</li> </ul>	<ul style="list-style-type: none"> <li>• Explain how to administer a McGill Pain Questionnaire</li> <li>• Assess pain during mock patient/client scenarios using a numeric pain scale</li> <li>• Discuss differences in acute versus chronic pain</li> <li>• Discuss various techniques for dealing with pain during wound interventions including               <ul style="list-style-type: none"> <li>○ Anti-anxiety medications</li> <li>○ Biofeedback</li> <li>○ Breaks</li> <li>○ Deep breathing</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Obtain a patient's/client's rating of pain using a numeric pain scale</li> <li>• Explain how providing a moist wound environment can aid in decreasing wound pain</li> <li>• Based on impairments and functional limitations, assess how a patient's/client's pain is affecting function</li> </ul>

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		<ul style="list-style-type: none"> <li>○ Distraction</li> <li>○ Electrical stimulation</li> <li>○ Non-contact ultrasound (MIST)</li> <li>○ Monochromatic infrared energy (MIRE)</li> <li>○ Music</li> <li>○ Moist wound environment</li> <li>○ Moisture retentive dressings</li> <li>○ Oral, intravenous (IV), intramuscular (IM), topical pain medications</li> <li>○ Rapport/empathy</li> </ul>	
<p>Current functional assessment</p> <ul style="list-style-type: none"> <li>● Range of motion</li> <li>● Strength</li> <li>● Mobility</li> <li>● Gait, locomotion and balance</li> <li>● Assistive and offloading devices</li> <li>● Current footwear</li> <li>● Activities of daily living</li> <li>● Work/school activities</li> <li>● Leisure activities</li> <li>● Reexamination including repeat of selected tests and measures</li> </ul>	<ul style="list-style-type: none"> <li>● Determine how specific integumentary compromise affects function</li> <li>● Determine assistive devices specific to the needs of the patient/client</li> </ul>	<ul style="list-style-type: none"> <li>● Perform basic functional assessments on classmates including ability for bed mobility, transfers, and gait</li> <li>● Based on mock patient/client scenarios, determine assistive devices for patients/clients with different levels of mobility, weight bearing ability, and strength</li> <li>● Identify abnormal wear patterns on shoes and discuss possible cause and effect situations and solutions</li> </ul>	<ul style="list-style-type: none"> <li>● Perform a basic functional assessment (ie, bed mobility, transfers, gait) on a patient/client with a wound or traumatic injury</li> <li>● Determine the need for assistive devices in patients/clients with open wounds and/or traumatic injury</li> </ul>
<b>Various Wound Diagnoses</b>			
<p>Including</p> <ul style="list-style-type: none"> <li>● Pressure ulcers including Stage I, II, III, IV, Unstageable, and deep tissue injury (DTI)</li> <li>● Vascular ulcers including venous, arterial, and mixed</li> <li>● Neuropathic ulcers</li> <li>● Traumatic</li> <li>● Surgical</li> <li>● Burns including thermal, chemical, electrical, and</li> </ul>	<ul style="list-style-type: none"> <li>● Differentiate between various types of wounds and correlate wound characteristics with possible etiologies</li> <li>● Describe wound types in documentation utilizing correct terminology</li> </ul>	<ul style="list-style-type: none"> <li>● Describe wound type characteristics that assist in differential diagnosis of arterial and venous ulcers</li> <li>● Describe burn wounds using depth terminology (superficial, superficial partial thickness, deep partial thickness, full thickness, subdermal) and explain the wound characteristics expected with each level of injury</li> <li>● Discuss areas of concern regarding traumatic injuries including <ul style="list-style-type: none"> <li>○ Insect/animal/human bites</li> <li>○ Gun shot</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>● Determine venous, arterial or mixed etiology in actual or mock patients/clients with lower extremity vascular ulcers</li> <li>● Discuss potential for dehiscence in post surgical wounds</li> <li>● Provide written and verbal communication utilizing correct terminology for</li> </ul>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
<p>radiation</p> <ul style="list-style-type: none"> <li>• Dermatological including psoriasis, contact dermatitis, and stasis dermatitis</li> <li>• Infection including necrotizing fasciitis, abscess, peritonitis, elephantiasis, lymphangitis, and hydradenitis suppurativa</li> <li>• Others including HIV/AIDS, Systemic Lupus Erythematosus, allergic reaction, sickle cell, cancer/tumor, scleroderma, rheumatoid, Stevens-Johnson, pyoderma gangrenosum, calciphylaxis, perineal, arthritic, factitial, and vasculitic</li> </ul>		<ul style="list-style-type: none"> <li>○ Punctures</li> <li>○ Amputations</li> <li>○ Skin tears</li> <li>○ Motor vehicle collisions</li> <li>○ Degloving, denudation, road rash</li> <li>○ Sutures</li> <li>○ IV, drain sites</li> <li>○ Maceration, excoriation</li> <li>• Discuss areas of concern regarding surgical wounds including <ul style="list-style-type: none"> <li>○ Sternotomy, sternectomy</li> <li>○ Extremity bypass graft, bypass graft</li> <li>○ Donor sites, failed flap/graft</li> <li>○ Fasciotomy</li> <li>○ Panniculectomy</li> <li>○ Amputations</li> <li>○ Tumor excision</li> <li>○ Pilonidal cyst</li> <li>○ Joint replacement</li> <li>○ Abdominal wounds</li> <li>○ Organ repair or replacement</li> <li>○ Dehisced wounds</li> </ul> </li> </ul>	<p>specific soft tissue injuries or wound types</p> <ul style="list-style-type: none"> <li>• Determine the stage of a pressure ulcer and explain level of tissue involvement</li> <li>• Identify and/or discuss characteristics of neuropathic wounds and differentiate between arterial and venous ulcers</li> </ul>
<p>Documentation</p> <ul style="list-style-type: none"> <li>• Examination <ul style="list-style-type: none"> <li>○ History</li> <li>○ Systems Review</li> <li>○ Tests and Measures (identification of impairments and functional limitations)</li> </ul> </li> <li>• Evaluation</li> <li>• Diagnosis</li> <li>• Prognosis (including plan of care)</li> </ul>	<ul style="list-style-type: none"> <li>• Demonstrate concise wound documentation including objective, goal-oriented, functional, and measurable outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss where specific components should be included in physical therapy documentation (ie, initial examination, progress, discharge notes)</li> <li>• Based on mock patient/client scenarios, accurately and thoroughly document a physical therapy initial note (eg: examination, evaluation, diagnosis, prognosis, plan of care)</li> <li>• Define common abbreviations associated with wound management</li> </ul>	<ul style="list-style-type: none"> <li>• Perform accurate and concise documentation for actual or case based patients/clients with open wounds</li> <li>• Become familiar with site specific approved abbreviations</li> </ul>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
<b>Interventions</b>			
Pressure redistribution <ul style="list-style-type: none"> <li>• Therapeutic positioning</li> <li>• Off loading</li> <li>• Seating/pressure mapping</li> <li>• Support surfaces</li> <li>• Specialized equipment</li> <li>• Frequent reassessment</li> <li>• Splinting</li> <li>• Casting</li> <li>• Orthotics</li> <li>• Skin care</li> <li>• Nutrition</li> <li>• Hydration</li> <li>• Management of incontinence</li> <li>• Movement/function through assessment of gait, locomotion and performance and independence in ADL's</li> </ul>	<ul style="list-style-type: none"> <li>• Describe methods used in the prevention of pressure ulcers</li> <li>• Assess the ability for patient/family/caregiver to participate in areas of prevention</li> <li>• Assess the need for patient/family/caregiver education and instruction in preventative care</li> <li>• Identify the need for referral to other health professionals in prevention</li> <li>• Collaborate with other health professionals in prevention</li> </ul>	<ul style="list-style-type: none"> <li>• Explain the importance of pressure relief including               <ul style="list-style-type: none"> <li>○ Basic therapeutic positioning</li> <li>○ Custom shoes, orthotics and support surfaces</li> <li>○ Heel relief devices and offloading</li> <li>○ Shifting of position every hour in a chair</li> <li>○ Turning/tilting every 2 hours in bed</li> </ul> </li> <li>• Discuss the use of skin protectants, moisturizers, and no rinse body wash</li> <li>• Discuss how physical therapy may collaborate with nursing/ostomy/incontinence professionals in cases of patient/client incontinence</li> <li>• Discuss the need for and frequency of pre-albumin testing for patients/clients at risk for malnutrition</li> <li>• Demonstrate how to utilize the Lower Extremity Amputation Prevention (LEAP) program for patients/clients with neuropathically involved lower extremities</li> <li>• Based on mock patient/client scenarios determine specific prevention needs, level of preventive participation, educational/training needs and perform necessary training</li> </ul>	<ul style="list-style-type: none"> <li>• Educate patient/family/caregiver about the importance of turning/shifting position in bed every 2 hours</li> <li>• Instruct family/caregiver regarding the need for and use of heel pressure relief devices</li> <li>• Educate patient/client regarding care of intact skin</li> <li>• Educate and train patient/family/caregiver regarding how nutrition and hydration may help prevent future skin breakdown</li> <li>• Identify need for referrals to other health professionals such as dieticians, specialized physicians and nursing</li> </ul>
Integumentary Repair and Protection Techniques <ul style="list-style-type: none"> <li>• Cleansing and irrigation</li> <li>• Hydration</li> <li>• Debridement               <ul style="list-style-type: none"> <li>○ Non-selective</li> <li>○ Autolytic</li> <li>○ Enzymatic</li> <li>○ Selective</li> <li>○ Biosurgical</li> <li>○ Surgical</li> </ul> </li> <li>• Primary dressings               <ul style="list-style-type: none"> <li>○ Alginate</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Discuss methods of cleansing, irrigating, and hydrating wound tissue</li> <li>• Discuss debridement strategies for acute and chronic wounds</li> <li>• Based on specific wound characteristics, identify wound dressings that will assist in maintaining a moist healing environment</li> <li>• Identify positive and negative signs of healing in closed</li> </ul>	<ul style="list-style-type: none"> <li>• Compare and contrast different methods for wound cleansing, irrigating and hydrating including               <ul style="list-style-type: none"> <li>○ Prepackaged, single dose, 8 psi, sterile saline irrigation</li> <li>○ Pulsed lavage with or without suction</li> <li>○ Syringe with angiocath or needle</li> <li>○ Whirlpool</li> </ul> </li> <li>• Discuss the potential benefits and risks to using               <ul style="list-style-type: none"> <li>○ Acetic acid (0.0025%)</li> <li>○ Dakin's solution (0.005%)</li> <li>○ Silver sulfadiazine</li> <li>○ Antibiotics (IV, oral)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Develop a plan of care for an actual or case based patient/client with an open wound including method of irrigation, debridement, dressing choice, and potential need for scar management</li> <li>• Determine if a patient/client is a candidate for compression therapy</li> <li>• Educate patient/client regarding oral antibiotic use</li> </ul>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
<ul style="list-style-type: none"> <li>○ Biosynthetic</li> <li>○ Cadexomer iodine</li> <li>○ Collagen</li> <li>○ Composite</li> <li>○ Contact layer</li> <li>○ Foam</li> <li>○ Filler</li> <li>○ Gauze</li> <li>○ Hydrocolloid</li> <li>○ Hydrofiber</li> <li>○ Hydrogel</li> <li>○ Silver</li> <li>○ Transparent film</li> <li>● Secondary dressings <ul style="list-style-type: none"> <li>○ Absorbent pads</li> <li>○ Burn pads</li> <li>○ Compression</li> <li>○ Contact casting</li> <li>○ Foam</li> <li>○ Gauze</li> <li>○ Transparent film</li> </ul> </li> <li>● Medications including over the counter, prescription, and home remedies</li> <li>● Growth factors</li> <li>● Skin substitutes</li> <li>● Sutures and staples</li> <li>● Periwound management</li> <li>● Scar management</li> <li>● Latex sensitivity</li> <li>● Patient/client and health care provider risk reduction and injury prevention</li> <li>● Possible reactions</li> <li>● Interventions for wound management</li> </ul>	<p>surgical wounds</p> <ul style="list-style-type: none"> <li>● Discuss wound management interventions relevant to scar</li> <li>● Develop a plan of care to include interventions for patients/clients with acute and chronic wounds</li> <li>● Discuss the issues involved with latex sensitivity for both the patient/client and health professionals</li> </ul>	<ul style="list-style-type: none"> <li>○ Topical antibiotics</li> <li>○ Antimicrobials (topical)</li> <li>● Discuss different patient/client scenarios and determine which method(s) of debridement would be the most appropriate including <ul style="list-style-type: none"> <li>○ Autolytic</li> <li>○ Biosurgical (sterile maggots)</li> <li>○ Enzymatic</li> <li>○ Low frequency ultrasound (22.5, 25, 35, 40 kHz devices)</li> <li>○ Mechanical</li> <li>○ Pulsed lavage with suction (4-15 psi)</li> <li>○ Sharp</li> <li>○ Surgical</li> </ul> </li> <li>● Compare and contrast qualities of the major types of dressings</li> <li>● Based on mock patient/client scenarios, determine secondary dressings that address the needs of the patient/client</li> <li>● List common home remedies and explain why these are not advised, including <ul style="list-style-type: none"> <li>○ Alcohol</li> <li>○ Hydrogen peroxide</li> <li>○ Povidone-iodine</li> <li>○ Turpentine</li> </ul> </li> <li>● Discuss positive and negative signs of healing in closed surgical wounds</li> <li>● Discuss the use, availability, benefit, application, precautions, and contraindications associated with growth factors and skin substitutes</li> <li>● Describe different methods for protecting periwound skin when securing dressings including <ul style="list-style-type: none"> <li>○ Breathable, flexible tape</li> <li>○ Binders</li> <li>○ Conforming roll/gauze</li> <li>○ Elastic/stretch net</li> <li>○ Hydrocolloid/thin foam for tape attachment</li> </ul> </li> </ul>	<p>in cases of wound infection</p> <ul style="list-style-type: none"> <li>● Identify positive and negative signs for healing of closed surgical wounds</li> <li>● Distinguish between regular sutures, staples, and retention sutures and identify risks associated with each</li> <li>● Identify patients/clients that may benefit from the use of growth factors and/or skin substitutes</li> <li>● Educate patient/client/family regarding the care and protection of new scar</li> <li>● Ensure code carts contain latex free items</li> <li>● Determine latex sensitivity in all patients/clients</li> <li>● Use latex free gloves when possible to limit your exposure to latex</li> </ul>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
		<ul style="list-style-type: none"> <li>○ Montgomery-type straps</li> <li>○ Self-adhesive gauze</li> <li>○ Skin preps and protectants</li> <li>• Compare and contrast hypertrophic and keloid scar</li> <li>• Discuss the benefits of massage, positioning, splinting, compression, range of motion, stretching and surgery in the management of scar tissue</li> <li>• Identify possible patient/client risk factors for developing latex allergies including <ul style="list-style-type: none"> <li>○ Frequent exposure</li> <li>○ Occupational hazards</li> <li>○ Multiple surgeries</li> <li>○ Spina bifida (myelomeningocele)</li> </ul> </li> <li>• Discuss possible negative reactions to latex including <ul style="list-style-type: none"> <li>○ Anaphylactic shock</li> <li>○ Cardiorespiratory death</li> <li>○ Chest pain, tachycardia, and hypotension</li> <li>○ Conjunctivitis</li> <li>○ Edema</li> <li>○ Erythema and pruitus</li> <li>○ Dyspnea</li> <li>○ Laryngeal spasm</li> <li>○ Papules, vesicles, and ulcers</li> <li>○ Rhinitis</li> <li>○ Seizures</li> <li>○ Wheezing</li> </ul> </li> <li>• Discuss possible healthcare worker and patient/client risk reduction and injury prevention interventions to avoid or limit latex exposure</li> </ul>	
<p>Physical agents, mechanical modalities and other adjunctive interventions</p> <ul style="list-style-type: none"> <li>• Compression including pneumatic, garments, long and short stretch elastic wraps, inelastic wraps and multi-layer bandaging</li> </ul>	<ul style="list-style-type: none"> <li>• Determine adjunctive interventions for chronic wound management</li> <li>• Distinguish between the effects of different low frequency US devices for debridement of fibrin</li> </ul>	<ul style="list-style-type: none"> <li>• Discuss the uses of Reed Sleeves, Circ Aid, and tubular bandages</li> <li>• Identify benefits, precautions, and contraindications to using multi-layer bandaging systems and pneumatic compression pumps and explain procedures for proper application</li> </ul>	<ul style="list-style-type: none"> <li>• Perform pneumatic compression on a patient/client in a safe manner</li> <li>• Perform electrical stimulation on an actual or mock</li> </ul>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
<p>systems</p> <ul style="list-style-type: none"> <li>• Physical agents including electrical stimulation, ultrasound, ultraviolet and others</li> <li>• Negative pressure wound therapy</li> <li>• Hydrotherapy including pulsed lavage with or without suction and whirlpool</li> <li>• Hyperbaric oxygen therapy (HBO)</li> <li>• Offloading devices</li> <li>• Control of bleeding</li> </ul>		<ul style="list-style-type: none"> <li>• Based on mock patient/client scenarios, determine which physical agents would be most effective and explain precautions and contraindications associated with each including <ul style="list-style-type: none"> <li>○ Electrical stimulation</li> <li>○ Ultrasound</li> <li>○ Ultraviolet</li> <li>○ Radio frequency stimulation</li> </ul> </li> <li>• Discuss the application process for negative pressure wound therapy</li> <li>• Compare and contrast risks and benefits of whirlpool and pulsed lavage with suction including <ul style="list-style-type: none"> <li>○ Cross contamination</li> <li>○ Maceration</li> <li>○ Need for additives</li> <li>○ Positioning of patient/client</li> <li>○ Pounds per square inch (psi)</li> <li>○ Risk of burns in neuropathic extremities</li> <li>○ Risk of increased edema</li> </ul> </li> <li>• Discuss the use and application of total contact casts</li> <li>• Identify methods to control bleeding including <ul style="list-style-type: none"> <li>○ Compression and elevation</li> <li>○ Chemical</li> <li>○ Cautery</li> </ul> </li> </ul>	<p>patient/client with an open wound where this would be an intervention of choice</p> <ul style="list-style-type: none"> <li>• Determine if a patient/client is a candidate for negative pressure wound therapy</li> <li>• Based on patient/client history, and wound etiology and characteristics, determine the most effective form of hydrotherapy for an actual or mock patient/client</li> <li>• Demonstrate proper technique with pulsed lavage with suction</li> </ul>
<p>Healthcare risk</p> <ul style="list-style-type: none"> <li>• Reduction/prevention of infection</li> <li>• Personal protective equipment (PPE) and Occupational Safety and Health Administration (OSHA) standard precautions</li> <li>• Engineering controls</li> <li>• Work practice controls and hazard communication</li> <li>• Immunizations and post exposure procedures</li> </ul>	<ul style="list-style-type: none"> <li>• Describe basic PPE/OSHA standard precautions as they apply to wound management</li> </ul>	<ul style="list-style-type: none"> <li>• Compare and contrast regular hand washing with soap and water and the use of hand sanitizer</li> <li>• Identify information commonly listed on Material Safety Data Sheets (MSDS)</li> <li>• Discuss the mechanisms for TB transmission and the personal protective equipment (PPE) necessary when treating a patient/client with active TB</li> </ul>	<ul style="list-style-type: none"> <li>• Identify locations of sharps containers, sinks, PPE storage, hand sanitizer, and Material Safety Data Sheets (MSDS) information within the work environment</li> <li>• Complete facility orientation requirements for blood borne pathogen, post exposure procedures, and other PPE/OSHA training</li> <li>• Attend session for TB mask</li> </ul>

Primary Content	Terminal Behavioral Objectives After the completion of the content, the student will be able to...	Example Instructional Objectives for the Classroom	Example Instructional Objective for the Clinic
<ul style="list-style-type: none"> <li>Tuberculosis (TB) and blood borne pathogen standards and training</li> </ul>			fitting
<b>Interdisciplinary Teamwork</b>			
<p>Possible members of a wound management team</p> <ul style="list-style-type: none"> <li>Patient/client</li> <li>Physician and/or surgeon</li> <li>Physical therapist</li> <li>Nurse</li> <li>Dietitian</li> <li>Case manager</li> <li>Social worker</li> <li>Infection control professional</li> <li>Pharmacist</li> </ul>	<ul style="list-style-type: none"> <li>Describe the roles of the various team members involved in interdisciplinary wound management</li> </ul>	<ul style="list-style-type: none"> <li>Using mock patient/client scenarios, determine how the assistance of various members of the wound management team benefit the overall care of a patient/client</li> <li>Discuss potential situations in which a physical therapist would need to contact a patient's/client's physician or surgeon</li> </ul>	<ul style="list-style-type: none"> <li>Attend case conferences for patients/clients with integumentary concerns</li> <li>Recommend referrals to other health care professionals to provide comprehensive care for a patient/client with integumentary concerns</li> </ul>
<b>Wound Management Business and Administration</b>			
<p>Exposure to reimbursement issues</p> <ul style="list-style-type: none"> <li>Coding overview including International Classification of Diseases 9<sup>th</sup> Revision (ICD-9), Current Procedural Terminology (CPT), and Healthcare Common Procedural Coding System (HCPCS)</li> <li>Overview of Medicare including Prospective Payment System (PPS), Resource Utilization Group (RUG), and Minimum Data Set (MDS)</li> </ul>	<ul style="list-style-type: none"> <li>Examine the various issues related to wound management reimbursement</li> </ul>	<ul style="list-style-type: none"> <li>Describe how ICD-9 codes are used and where to find these codes</li> <li>Discuss reimbursement issues with Medicare</li> </ul>	<ul style="list-style-type: none"> <li>Demonstrate or discuss utilization of the correct code for wound management billing and reimbursement</li> </ul>

## References and Resources

### Websites:

- Agency for Health Research and Quality (AHRQ) Guidelines [www.ahrq.gov](http://www.ahrq.gov)
- American Academy of Wound Management (AAWM) [www.aawm.org](http://www.aawm.org)
- American Burn Association (ABA) [www.ameriburn.org](http://www.ameriburn.org)
- American with Disabilities Act (ADA) [www.diabetes.org](http://www.diabetes.org)
- American Physical Therapy Association (APTA) [www.apta.org](http://www.apta.org)
- APTA Section on Clinical Electrophysiology and Wound Management (SCEWM) [www.aptasce-wm.org](http://www.aptasce-wm.org)
- Association for the Advancement of Wound Care (AAWC) [www.aawconline.org](http://www.aawconline.org)
- European Pressure Ulcer Advisory Panel (EPUAP)
- National Pressure Ulcer Advisor Panel (NPUAP) [www.npuap.org](http://www.npuap.org)
- Occupational Safety and Health Administration (OSHA) [www.osha.gov](http://www.osha.gov)
- World Union of Wound Healing Societies (WUWHS) [www.wuwhs.org](http://www.wuwhs.org)
- [www.bphc.hrsa.gov/leap/WhatIsLEAP.htm](http://www.bphc.hrsa.gov/leap/WhatIsLEAP.htm)
- [www.WorldWideWounds.com/Common/Topics.html](http://www.WorldWideWounds.com/Common/Topics.html)

### Textbooks:

- Baranoski S, Ayello EA, *Wound Care Essentials, Practice Principles*, Lippincott, 2004
- *Guide to Physical Therapist Practice*, APTA Publication
- Falabella AF, Kirsner RS, (eds): *Wound Healing*. Taylor & Francis, Boca Raton, New York, 2005.
- Kloth LC, McCulloch JM, (eds): *Wound Healing: Alternatives in Management*, ed 3. FA Davis, Philadelphia, 2002. [4<sup>th</sup> edition available 2008]
- Krasner DL, Rodeheaver GT, & Sibbald RG, (eds): *Chronic Wound Care: A Clinical Source Book for Healthcare Professionals*, 3<sup>rd</sup> edition, HMP Communications, Wayne, PA 2001.
- Hess CT, *Wound Care*, 4<sup>th</sup> edition, Springhouse, Springhouse, PA 2002
- Practice Guideline for Health Care Professionals (PVA)
- Sussman C, Bates-Jensen B, (eds): *Wound Care: A Collaborative Practice Manual for Health Care Professionals*, ed 3. Wolters Kluwer/Lippincott Williams and Wilkins, Philadelphia, 2007.
- Treatment of Pressure Ulcers – Clinical Practice Guideline: United States Department of Health and Human Services (USDHHS) / AHCPR (now AHRQ)
- *Pathology: Implications for the Physical Therapist*. C. Goodman, W. Boissonnault. W.B.Saunders/Mosby. 2003, 2<sup>nd</sup> edition. [3<sup>rd</sup> edition in press]

### Other:

- Industry/vendors