APTA's Academy of 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
Normal Tissue Healing – Anatomy, Physiology, and Influencing Factors			

Anatomy of the skin
• Function of the skin
• Layers of the skin, including primary cells and vascular supply
Physiology of healing
• Activation of platelets and the process of hemostasis
• Normal physiology of tissue healing, including the phases of healing
• Types of wound closure
Factors that can affect tissue healing
• Systemic factors
• Local factors
	• Identify complications that may result from skin loss
	• Explain the structure and function of dermal appendages and their benefit in wound closure
	• Describe the depth of tissue damage using relevant terms
	• Explain the role and function of cells primarily involved in tissue healing
	• Identify the important aspects associated with the phases of normal wound healing including wound closure and ultimate healing
	• Discuss the clinical significance of general systemic and local factors that can impede tissue healing
	• Describe how diabetes mellitus specifically can impair healing
		• Describe the functions of skin.
		• Identify structural components of the skin
		• Define terms associated with wound depth, including superficial, partial thickness, and full thickness
		• Describe the function of cells primarily active in tissue healing including platelets, fibroblasts, myofibroblasts, mast cells, macrophages, and neutrophils
		• Describe the process of hemostasis
		• Describe the phases of tissue healing including hemostasis, inflammation, proliferation, epithelialization, and remodeling
		• Define the types of wound closure including primary intention, secondary intention, and delayed primary intention
		• Describe and understand systemic factors that can impede tissue healing including co-morbidities
		  ○ Nutrition/hydration
		  ○ Diabetes mellitus
		  ○ Peripheral vascular disease
		  ○ Gastroesophageal reflux
			• Describe areas of integumentary interruption by level of wound depth
			• Identify primary phase of healing based on identifiable soft tissue characteristics
			• Discuss and/or identify the overlapping stages of wound healing visible in an open wound
			• Identify the method(s) of wound closure in various actual or case based wounds
			• Provide patient education regarding how factors that may impede tissue healing can be altered
			• Educate patient regarding the significance of glucose control on soft tissue healing

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		disease (GERD) ○ Collagen disease ○ End-stage renal disease ○ Immunosuppression ○ Aging ○ Medications ○ Social/health habits ○ Functional status and activity level ○ Infection ○ Paresthesia ○ Perfusion ○ Incontinence ○ Psychological function (eg stress, memory, anxiety) • Describe and understand local factors that can impede tissue healing including ○ Exuberant tissue (hypergranulation) ○ Perfusion/oxygenation ○ tobacco use ○ Infection ○ High bacterial burden ○ Biofilms ○ Edema ○ Pressure/friction/shear ○ Moisture (maceration) ○ Sensation/neuropathy ○ Hyperkeratosis ○ Epibole ○ Cellulitis ○ Nonviable tissue ○ Lack of growth factors ○ Cytokines ○ Matrixmetalloproteases (MMPs) • Tissue inhibitors of MMPs	

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
Psychosocial Issues			
Possible concerns • Quality of life issues • Effects of isolation • Cosmesis and self-image • Effects of chronic illness • Stress (patient, family, caregiver) • Health care expenses and lost wages • Occupational and lifestyle changes • Social habits • Palliative care • Sleep	• Discuss the various psychological issues involved in wound management • Discuss the role of psychological stress on overall wound healing	• Based on mock patient scenarios, discuss possible psychological issues patients might encounter in cases of traumatic amputation, facial burns, or odiferous wounds associated with terminal cancer • Identify possible effects of chronic illness including stress, anger, depression, financial stress, isolation, and dependence on a patient's ability to deal with open wounds • Discuss possible roles of the physical therapist in palliative care for a patient with an open wound • Discuss how to address goals within the plan of care in cases of palliative care • Identify sources of support including referral to other health professionals and/or community organizations	• Identify possible psychological complications present in a patient with traumatic injury • Identify potential local sources of support for patients, family, or caregiver dealing with psychological issues
Examination			
Patient history • General demographics including age, height, weight • Social history including culture, resources, activities, and support systems • Employment/work • Growth and development • Living environment and destination at conclusion of care • General health status and function including self-care and domestic responsibilities, education, work, and community,	• Explain the significance and role of patient general, family, and social information on accurate examination, evaluation, diagnosis and prognosis (including plan of care).	• Identify benefits to understanding the history of a patient's current illness • Discuss issues surrounding the patient's level of function and mobility and how these factors can influence wound healing potential. • Determine critical general, family, social, and wound factors when planning for conclusion of care • Discuss the importance of date of onset and mechanism of injury in determining therapeutic interventions • Explain how aspirin and other anticoagulant use by a patient can influence intervention choices	• Perform a thorough subjective examination collecting pertinent general, family, social, and soft tissue injury historical information • Inform patient about behavioral health risks (eg, tobacco and alcohol use) and how these can delay healing • Determine whether a wound is in the acute, subacute, or chronic state based on actual or mock subjective

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
social, and civic life. • Family history • Social habits and behavioral health risks including tobacco, alcohol, drug abuse, and fitness • Past medical/surgical history including, cardiovascular endocrine/metabolic, gastrointestinal, genitourinary, previous wounds/dermatologic conditions, musculoskeletal, neuromuscular, and prior hospitalizations • Current condition(s)/chief complaint(s) including patient needs, concerns, current and prior wound interventions • Injury/disease including onset, mechanism, course of events, symptoms, and patient or family/caregiver expectations and goals • Functional status and activities of daily living (ADLs) • Medications including steroids, antibiotics, anticoagulants, chemotherapy, radiation, insulin, nonsteroidal anti-inflammatory drugs (NSAIDS), analgesics, herbals, and home remedies			information • Determine if a patient's current medications prevent him/her from participating in physical therapy or receiving a particular intervention • Review a patient's complete history and identify factors that could negatively and positively affect the patient's prognosis for rehabilitation • Recommend plans for conclusion of care for a patient based on general, family, social, and tissue healing information

Systems Review

Gross screening of general systems • Cardiovascular and Pulmonary • Integumentary • Musculoskeletal • Neuromuscular	• Discuss how abnormal vital signs may impact tissue healing potential	• Demonstrate skill in performing basic systems review testing including ○ Blood pressure ○ Heart rate	• Demonstrate correct technique in obtaining basic vital sign information • Perform a gross screen to

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
		○ Respiratory rate ○ Gross strength ○ Gross symmetry ○ Gross motor function • Demonstrate skill in performing basic systems review via visual screening including ○ Presence of edema ○ Presence of scar tissue ○ Presence of skin discoloration and nail abnormalities ○ Gross symmetry ○ Gross motor function	assess a patient's overall general muscle performance and range of motion
Integumentary Tests and Measures			
Wound characteristics • Wound dimensions including surface area (SA) and depth • Wound bed/margins including tissue type, color, quality, presence of anatomical structures, and phase of healing • Drainage/exudate including type, amount, consistency and odor • Classifications including etiology and wound type, depth of tissue destruction, tissue color, and infection • Photodocumentation Pressure risk assessments • Braden, Norton, and Gosnell Vascular testing • Distal pulses, Doppler ultrasound, ankle brachial index (ABI), LEA, and digital photoplethysmography (D-PPG), transcutaneous pulse oximetry (TCOM)	• Describe methods of measuring wound surface area and depth. • Identify and determine the quality of various tissue types/anatomical structures present within wounds. • Describe wound drainage/exudate characteristics as related to wound status. • Utilize classification models including wound type, depth, and tissue color in determining wound status. • Identify factors that predict risk of developing pressure ulcers • Describe the technique and significance of Doppler ultrasound and ABI in establishing vascular status	• 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. • Discuss different methods of recording wound surface area and depth including ○ Clock method of length (12 to 6 o'clock) and width (3-9 o'clock) ○ Perpendicular method (longest length x longest width) ○ Deepest wound base ○ Extent of tracts, tunnels, and undermining (clock method) ○ Photographs ○ Wound tracings ○ Digitization • Determine status of exposed, identified tissues and anatomical structures including ○ Adipose tissue ○ Blood vessels ○ Bone	• Demonstrate and/or discuss technique of documenting wound surface area using linear measurement • Discuss and/or identify normal and abnormal appearance and quality of exposed tendon and granulation tissue in open wounds • Evaluate and/or discuss wound drainage characteristics and relate to wound status • Utilize published photodocumentation or current patient cases to compare and contrast wound characteristics demonstrated during normal phases of healing • Determine a patient's ability

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Neuropathic testing • Wagner and Semmes Weinstein Monofilament	• Describe the technique when utilizing a monofilament to assess protective sensation of the foot	○ Fascia ○ Granulation tissue ○ Muscle ○ Tendon ○ Fibrin and eschar ○ Slough • Discuss the process of examining wound drainage/exudate based on ○ Type ▪ serous ▪ serosanguineous ▪ sanguineous ▪ purulent ○ Amount ▪ none ▪ scant ▪ min ▪ mod ▪ copious ○ Consistency ▪ Viscous ▪ ▪ watery ○ Odor ▪ none ▪ foul ▪ putrid • Discuss tissue classification models including ○ Pressure ulcer staging ○ Wagner's ○ University of Texas classification for diabetic foot ulcers ○ Clinical, etiology, anatomic, pathophysiological classification system	for bed mobility and pressure relief while in bed • Demonstrate a Semmes Weinstein Monofilament test • Palpate/ascultate dorsalis pedis and posterior tibialis pulses

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		(CEAP) ○ Red, black, yellow tissue color • Discuss the benefits and challenges associated with photo documentation. • Discuss the relevance of risk assessment scales and tests such as Braden, Doppler ultrasound, ABI, and Wagner • Determine which scales are relevant for specific wound types	
Examination of Periwound Tissue • Callus • Erythema • Excoriation • Fungal infections • Hemosiderin staining • Hyperkeratosis • Induration • Maceration • Scale • Scarring • Xerosis • Edema • Tenderness to palpation	• Discuss wound management interventions relevant to the treatment of periwound tissue	• Discuss potential difficulties in identifying erythema in darkly pigmented skin • Discuss the meaning of induration including etiology and how it can be a sign of infection • Explain the negative effects of maceration • Relate wound type and hemosiderin staining • Describe the mechanism behind callus formation and the benefits of saucerization, especially in patients with diabetes mellitus • Compare and contrast scar tissue and healthy, normal skin including strength, mobility, vascular supply, and function	• Assess skin characteristics surrounding an open wound or other area of soft tissue injury and identify instances of erythema, induration, callus, and/or scarring • Provide patient education regarding the cause and associated negative aspects of maceration and adjust the plan of care to prevent continuation of maceration • Provide patient education regarding the mechanism and significance of hemosiderin staining
Infection • Signs of critical colonization • Signs and symptoms of infection • Local versus systemic infection • Types of infection including cellulitis, lymphangitis, sepsis and osteomyelitis	• Differentiate between signs of inflammation and infection • Recognize and differentiate the signs and symptoms of critical colonization and infection	• Recognize the following as possible signs and symptoms of infection ○ Abnormal lab values ○ Edema ○ Erythema ○ Fever	• Provide patient education regarding the signs and symptoms of infection • Visually inspect the integument to identify signs and symptoms of infection in

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
• Tests and measures to identify infection • Bioburden		○ Friable granulation tissue ○ Increased and/or purulent drainage ○ Induration ○ Increased pain ○ Increased glucose levels in patients with diabetes mellitus ○ Increased local temperature ○ Odor after irrigation • Based on mock patient scenarios, determine whether specific signs and symptoms listed above are most likely related to infection or other etiology • Given specific patient case information, determine which test(s)/measure(s) would be most effective ○ Laboratory tests ○ Radiographic tests ○ Wound biopsy ○ Wound culture • Discuss the differences between contamination, colonization, critical colonization, and infection.	a patient and determine whether these signs are related to infection or normal inflammation • Discuss alternative (ie lab findings) tests/measures for determining infection in specific patient situations
Infection control measures • Sterile versus clean technique • Standard precautions • Isolation • Hand washing • Infections • Cleaning and disinfection of equipment • Aerosolization risks with irrigation and low frequency US devices	• Discuss the need for and use of infection prevention measures • Identify the different levels of isolation and discuss the protective measures associated with each • Discuss disposal of soiled dressings and sharp instruments	• Determine personal protective equipment necessary for each level of isolation • Discuss potential for aerosolization for different methods of hydrotherapy/irrigation and low frequency US devices and for risk reduction • Demonstrate proper technique to don sterile gloves • Demonstrate proper technique for removal of contaminated gloves	• Demonstrate universal precautions when working with patients • Don/doff personal protective equipment dependent upon patient isolation status • Dedicate equipment to patients with isolation precautions • Demonstrate proper disposal of dressings and sharp instruments

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
Dressings and debridement interventions for infection • Antimicrobial dressings • Inappropriate solutions including hydrogen peroxide and povidone-iodine • Inappropriate use of occlusive dressings when there is infection • Precautionary use of acetic acid and Dakin's solution • Debridement to decrease potential/current wound infection	• Determine dressings to use on infected wounds • Based on wound characteristics, determine the need for debridement	• Identify dressings that contain antimicrobial/ antibacterial factors • Based on mock patient scenarios, determine the type of dressing that would be most effective for infected wounds	• Provide an actual or mock plan of care including dressing choice and debridement (if necessary) to help manage a patient's local wound infection
Sensory integrity • Deep pressure • Light touch • Kinesthesia • Position sense • Protective sensation • Sharp/dull • Temperature • Vibration	• Perform relevant noninvasive sensory integrity tests and measures	• Perform tests and measures for light touch utilizing a cotton ball and a monofilament • Perform tests and measures of graphesthesia, stereognosis, and vibration on classmates	• Determine protective sensation on a patient with diabetes mellitus using a monofilament • Test sharp/dull sensation on a patient

Pain specific to open wounds
• Impact on function
• Related pain interventions
	• Determine wound related pain interventions	• Explain how to administer a McGill Pain Questionnaire
		• Assess pain during mock patient scenarios using a numeric pain or visual analog scale (VAS)
		• Discuss differences in acute versus chronic pain
		• Discuss various techniques for dealing with pain during wound interventions including
		  ○ Anti-anxiety medications
		  ○ Biofeedback
		  ○ Breaks
		  ○ Deep breathing
		  ○ Distraction
		  ○ Electrical stimulation
			• Obtain a patient's rating of pain using a numeric pain scale
			• Explain how providing a moist wound environment can aid in decreasing wound pain
			• Based on impairments and activity limitations and participation restrictions, assess how a patient's pain is affecting functioning
			• Assess response to

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		○ Non-contact ultrasound (MIST) ○ Monochromatic infrared energy (MIRE) ○ Music ○ Moist wound environment ○ Moisture retentive dressings ○ Oral, intravenous (IV), intramuscular (IM), topical pain medications ○ Rapport/empathy	interventions geared toward pain reduction
Current examination • Range of motion • Muscle performance Joint integrity and mobility (including locomotion) • Gait • Balance • Assistive technologies including offloading devices • Current footwear • Self-care • Education and work/ life activities • Community, social, and civic life • Reexamination including repeat of selected tests and measures	• Determine how specific integumentary compromise affects function • Determine assistive devices specific to the needs of the patient	• Perform basic functional assessments on classmates including ability for bed mobility, transfers, and gait • Based on mock patient scenarios, determine assistive devices for patients with different levels of mobility, weight bearing ability, and strength • Identify abnormal wear patterns on shoes and discuss possible cause and effect situations and solutions	• Perform a basic functional assessment (ie, bed mobility, transfers, gait) on a patient with a wound or traumatic injury • Determine the need for assistive devices in patients with open wounds and/or traumatic injury
Various Wound Diagnoses			
Including • Pressure ulcers including Stage I, II, III, IV, Unstageable, and Suspected DeepTissue Injury (DTI) • Vascular ulcers including venous, arterial, and mixed • Neuropathic ulcers • Traumatic • Surgical	• Differentiate between various types of wounds and correlate wound characteristics with possible etiologies • Describe wound types in documentation using correct terminology	• Describe wound type characteristics that assist in differential diagnosis of arterial and venous ulcers • 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 • Discuss areas of concern regarding traumatic injuries including	• Determine venous, arterial or mixed etiology in actual or mock patients with lower extremity vascular ulcers • Discuss potential for dehiscence in post-surgical wounds • Provide written and verbal communication using correct

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
• Burns including thermal, chemical, electrical, and radiation • Dermatological including psoriasis, contact dermatitis, and stasis dermatitis • Infection including necrotizing fasciitis, abscess, peritonitis, elephantiasis, lymphangitis, and hydradenitis suppurativa • 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		○ Insect/animal/human bites ○ Gun shot ○ Punctures ○ Amputations ○ Skin tears ○ Motor vehicle collisions ○ Degloving, denudation, road rash ○ Sutures ○ IV, drain sites ○ Maceration, excoriation • Discuss areas of concern regarding surgical wounds including ○ Sternotomy, sternectomy ○ Extremity bypass graft, bypass graft ○ Donor sites, failed flap/graft ○ Fasciotomy ○ Panniculectomy ○ Amputations ○ Tumor excision ○ Pilonidal cyst ○ Joint replacement ○ Abdominal wounds ○ Organ repair or replacement ○ Dehisced wounds	terminology for specific soft tissue injuries or wound types • Determine the stage of a pressure ulcer and explain level of tissue involvement • Identify and/or discuss characteristics of neuropathic wounds and differentiate between arterial and venous ulcers
Documentation • Examination ○ History ○ Systems review ○ Tests and measures (identification of impairments of body functions and structures, activity limitations, and participation restrictions)	• Demonstrate concise wound documentation including objective, goal-oriented, functional, and measurable outcomes	• Discuss where specific components should be included in physical therapy documentation (ie, initial examination, progress, conclusion of care notes) • Based on mock patient scenarios, accurately and thoroughly document a physical therapy initial note (eg: examination, evaluation, diagnosis, prognosis, plan of care) • Demonstrate appropriate use of approved medical abbreviations	• Perform accurate and concise documentation for actual or case based patients with open wounds • Demonstrate appropriate use of approved medical abbreviations • Develop appropriate short and long term goals for wound and functional

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• Evaluation • Diagnosis • Prognosis Plan of care including goals		• Based on mock scenarios, discuss goal writing for wound healing and associated functional gains	progress
Interventions			

Pressure redistribution
• Therapeutic positioning
• Off loading
• Seating/pressure mapping
• Support surfaces
• Specialized equipment
• Frequent re-examination and evaluation
• Splinting
• Casting
• Orthotics
• Skin care
• Nutrition
• Hydration
• Management of incontinence
• Movement/function through examination of gait, locomotion and independence in ADL's
	• Describe methods used in the prevention of pressure ulcers
	• Assess the ability for patient/family/caregiver to participate in areas of prevention
	• Assess the need for patient/family/caregiver education and instruction in preventative care
	• Identify the need for referral to other health professionals in prevention
	• Collaborate with other health professionals in prevention
		• Explain the importance of pressure relief including
		  ○ Basic therapeutic positioning
		  ○ Custom shoes, orthotics and support surfaces
		  ○ Heel relief devices and offloading
		  ○ Shifting of position every hour in a chair
		  ○ Turning/tilting every 2 hours in bed
		• Discuss the use of skin protectants, moisturizers, and no rinse body wash
		• Discuss how physical therapy may collaborate with nursing/ostomy/incontinence professionals in cases of patient incontinence
		• Discuss the need for and frequency of pre-albumin testing for patients at risk for malnutrition
		• Demonstrate how to utilize the Lower Extremity Amputation Prevention (LEAP) program for patients with neuropathically involved lower extremities
		• Based on mock patient scenarios determine specific prevention needs, level of preventive participation, educational/training needs and perform necessary training
			• Educate patient/family/caregiver about the importance of turning/shifting position in bed every 2 hours
			• Instruct family/caregiver regarding the need for and use of heel pressure relief devices
			• Educate patient regarding care of intact skin
			• Educate and train patient/family/caregiver regarding how nutrition and hydration may help prevent future skin breakdown
			• Identify need for referrals to other health professionals such as dieticians, specialized physicians and nursing

Integumentary Repair and Protection Techniques
• Cleansing and irrigation
• Hydration
• Debridement
  ○ Mechanical
  ○ Autolytic
	• Discuss methods of cleansing, irrigating, and hydrating wound tissue
	• Discuss debridement strategies for acute and chronic wounds
		• Compare and contrast different methods for wound cleansing, irrigating and hydrating including
		  ○ Prepackaged, single dose, 8 psi, sterile saline irrigation
		  ○ Pulsed lavage with or without suction
		  ○ Syringe with angiocath or needle
			• Develop a plan of care for an actual or case based patient with an open wound including method of irrigation, debridement, dressing choice, and potential

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○ Enzymatic ○ Sharp ○ Chemical ○ Biosurgical ○ Surgical • Primary dressings ○ Alginate ○ Biosynthetic ○ Cadexomer idodine ○ Collagen ○ Composite ○ Contact layer ○ Foam ○ Filler ○ Gauze ○ Hydrocolloid ○ Hydrofiber ○ Hydrogel ○ Antimicrobial ▪ Silver ▪ Honey ▪ Cadexomer iodine ○ Transparent film • Secondary dressings ○ Absorbent pads ○ Burn pads ○ Compression ○ Contact casting ○ Foam ○ Gauze ○ Transparent film • Medications including over the counter, prescription, and home remedies • Growth factors	• Based on specific wound characteristics, identify wound dressings that will assist in maintaining a moist healing environment • Identify positive and negative signs of healing in closed surgical wounds • Discuss wound management interventions relevant to scar • Develop a plan of care to include interventions for patients with acute and chronic wounds • Discuss the issues involved with latex sensitivity for both the patient and health professionals	○ Whirlpool • Discuss the potential benefits and risks to using ○ Acetic acid (0.0025%) ○ Dakin's solution (0.005%) ○ Silver sulfadiazine ○ Antibiotics (IV, oral) ○ Topical antibiotics ○ Antimicrobials (topical) • Discuss different patient scenarios and determine which method(s) of debridement would be the most appropriate including ○ Autolytic ○ Biosurgical (sterile maggots) ○ Enzymatic ○ Low frequency ultrasound (22.5, 25, 35, 40 kHz devices) ○ Mechanical ○ Pulsed lavage with suction (4-15 psi) ○ Sharp ○ Surgical • Compare and contrast qualities of the major types of dressings • Based on mock patient scenarios, determine secondary dressings that address the needs of the patient • List common home remedies and explain why these are not advised, including ○ Alcohol ○ Hydrogen peroxide ○ Povidone-iodine ○ Turpentine • Discuss positive and negative signs of healing in closed surgical wounds • Discuss the use, availability, benefit, application, precautions, and contraindications associated with growth factors and skin substitutes	need for scar management • Determine if a patient is a candidate for compression therapy • Educate patient regarding oral antibiotic use in cases of wound infection • Identify positive and negative signs for healing of closed surgical wounds • Distinguish between regular sutures, staples, and retention sutures and identify risks associated with each • Identify patients that may benefit from the use of growth factors and/or skin substitutes • Educate patient/family regarding the care and protection of new scar • Ensure code carts contain latex free items • Determine latex sensitivity in all patients • Use latex free gloves when possible to limit your exposure to latex

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

• Skin substitutes
• Sutures and staples
• Periwound management
• Scar management
• Latex sensitivity
• Patient and health care provider risk reduction and injury prevention
• Possible reactions
• Interventions for wound management
		• Describe different methods for protecting periwound skin when securing dressings including
		  ○ Breathable, flexible tape
		  ○ Binders
		  ○ Conforming roll/gauze
		  ○ Elastic/stretch net
		  ○ Hydrocolloid/thin foam for tape attachment
		  ○ Montgomery-type straps
		  ○ Self-adhesive gauze
		  ○ Skin preps and protectants
		• Compare and contrast hypertrophic and keloid scar
		• Discuss the benefits of massage, positioning, splinting, compression, range of motion, stretching and surgery in the management of scar tissue
		• Identify possible patient risk factors for developing latex allergies including
		  ○ Frequent exposure
		  ○ Occupational hazards
		  ○ Multiple surgeries
		  ○ Spina bifida (myelomeningocele)
		• Discuss possible negative reactions to latex including
		  ○ Anaphylactic shock
		  ○ Cardiorespiratory death
		  ○ Chest pain, tachycardia, and hypotension
		  ○ Conjunctivitis
		  ○ Edema
		  ○ Erythema and pruitus
		  ○ Dyspnea
		  ○ Laryngeal spasm
		  ○ Papules, vesicles, and ulcers
		  ○ Rhinitis
		  ○ Seizures
		  ○ Wheezing
		• Discuss possible healthcare worker and patient risk	

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		reduction and injury prevention interventions to avoid or limit latex exposure	

Biophysical agents and other adjunctive interventions
• Compression including pneumatic, garments, long and short stretch elastic wraps, inelastic wraps and multi-layer bandaging systems
• Electrical stimulation, ultrasound, ultraviolet, nonthermal infrared and others
• Negative pressure wound therapy
• Hydrotherapy including pulsed lavage with or without suction and whirlpool
• Hyperbaric oxygen therapy (HBO)
• Offloading devices
• Control of bleeding
	• Determine adjunctive interventions for chronic wound management
	• Distinguish between the effects of different low frequency US devices for debridement of fibrin
		• Discuss the uses of Reed Sleeves, Circ Aid, and tubular bandages
		• Identify benefits, precautions, and contraindications to using multi-layer bandaging systems and pneumatic compression pumps and explain procedures for proper application
		• Based on mock patient scenarios, determine which physical agents would be most effective and explain precautions and contraindications associated with each including
		  ○ Electrical stimulation
		  ○ Ultrasound
		  ○ Ultraviolet
		  ○ Radio frequency stimulation
		• Discuss the application process for negative pressure wound therapy
		• Compare and contrast risks and benefits of whirlpool and pulsed lavage with suction including
		  ○ Cross contamination
		  ○ Maceration
		  ○ Need for additives
		  ○ Positioning of patient
		  ○ Pounds per square inch (psi)
		  ○ Risk of burns in neuropathic extremities
		  ○ Risk of increased edema
		• Discuss the use and application of total contact casts
		• Identify methods to control bleeding including
		  ○ Compression and elevation
		  ○ Chemical
		  ○ Cautery
			• Perform pneumatic compression on a patient in a safe manner
			• Perform electrical stimulation on an actual or mock patient with an open wound where this would be an intervention of choice
			• Determine if a patient is a candidate for negative pressure wound therapy
			• Based on patient history, and wound etiology and characteristics, determine the most effective form of hydrotherapy for an actual or mock patient
			• Demonstrate proper technique with pulsed lavage with suction

Healthcare risk • Reduction/prevention of infection • Personal protective equipment	• Describe basic PPE/OSHA standard precautions as they	• Compare and contrast regular hand washing with soap and water and the use of hand sanitizer	• Identify locations of sharps containers, sinks, PPE

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(PPE) and Occupational Safety and Health Administration (OSHA) standard precautions • Engineering controls • Work practice controls and hazard communication • Immunizations and post exposure procedures • Tuberculosis (TB) and blood borne pathogen standards and training	apply to wound management	• Identify information commonly listed on Material Safety Data Sheets (MSDS) • Discuss the mechanisms for TB transmission and the personal protective equipment (PPE) necessary when treating a patient with active TB	storage, hand sanitizer, and Material Safety Data Sheets (MSDS) information within the work environment • Complete facility orientation requirements for blood borne pathogen, post exposure procedures, and other PPE/OSHA training • Attend session for TB mask fitting
Interdisciplinary Teamwork			
Possible members of a wound management team • Patient • Physician and/or surgeon • Physical therapist • Nurse • Dietitian • Case manager • Social worker • Infection prevention professional • Pharmacist • Orthotist/prosthetist	• Describe the roles of the various team members involved in interdisciplinary wound management	• Using mock patient scenarios, determine how the assistance of various members of the wound management team benefit the overall care of a patient • Discuss potential situations in which a physical therapist would need to contact a patient's physician or surgeon	• Attend case conferences for patients with integumentary concerns • Recommend referrals to other health care professionals to provide comprehensive care for a patient with integumentary concerns
Wound Management Business and Administration			
Exposure to reimbursement issues • Coding overview including current International Classification of Diseases (ICD) codes, Current Procedural Terminology (CPT), and Healthcare Common Procedural Coding System (HCPCS) • Overview of Medicare including Prospective Payment System	• Examine the various issues related to wound management reimbursement	• Describe how current ICD- codes are used and where to find these codes • Discuss reimbursement issues with Medicare and other third party payers	• Demonstrate or discuss utilization of the correct codes for wound management billing and reimbursement

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
(PPS), Resource Utilization Group (RUG), and Minimum Data Set (MDS)			

References and Resources

Websites:

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

Textbooks:

- Baranoski S, Ayello EA. *Wound Care Essentials, Practice Principles, 2nd ed.,* Lippincott, 2007.
- Falabella AF, Kirsner RS, (eds): *Wound Healing*. Taylor & Francis, Boca Raton, New York, 2005.
- Goodman C,Boissonnault W. *Pathology: Implications for the Physical Therapist*, 3rd ed., W.B.Saunders/Mosby, 2008.
- *Guide to Physical Therapist Practice 3.0*. Alexandria, VA: American Physical Therapy Association; 2014.
- Hess CT. *Wound Care,* ed. 7, Springhouse, Springhouse, PA 2012
- Irion GL. *Comprehensive Wound Management, 2nd ed.,* Slack Inc., 2009.
- Krasner DL, Rodeheaver GT, & Sibbald RG, (eds)*: Chronic Wound Care: A Clinical Source Book for Healthcare Professionals*, 5th ed. HMP Communications, Wayne, PA 2012.
- McCulloch JM, Kloth LC, (eds): *Wound Healing: Evidence-Based Management*, 4th ed., FA Davis, Philadelphia, 2010.
- Myers, BA. *Wound Management: Principles and Practice*, 3rd ed. Pearson Education, Inc, Upper Saddle River, NJ, 2012.
- Practice Guideline for Health Care Professionals (PVA)
- Sussman C, Bates-Jensen B, (eds). *Wound Care: A Collaborative Practice Manual for Health Professionals*, 4th ed. Wolters Kluwer/Lippincott Williams and Wilkins, Philadelphia, 2012.
- 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, Fuller, K. W.B. Saunders/Mosby. 2008, 4th edition.
- Other: Industry/vendors

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