



2023 Entry-Level Physical Therapist Curriculum Recommendations for Integumentary/Wound Management

Academy of Clinical Electrophysiology & Wound Management: Wound
Management Special Interest Group

A component of the American Physical Therapy Association

Ever advancing knowledge and technology drives change in healthcare education and practice. Subsequently, integumentary/wound management-related knowledge and skill expectations for entry-level physical therapists continue to grow and expand.

The Academy of Clinical Electrophysiology and Wound Management's (ACEWM) Wound Management Special Interest Group (WMSIG) present the following recommendations to support academic and clinical faculty in developing, updating, and implementing a robust entry-level integumentary/wound management curricular plan. These consensus-based recommendations were developed through a Delphi process in 2022-2023 and represent the opinions of academic and clinical faculty from across the country.

Recognizing that education programs dedicate varying amounts of time to integumentary/wound management content, topics are divided into "Need to Include" and, where applicable, "Nice to Include" categories to assist faculty in prioritizing content based on available contact hours.

It is important to recognize that some general "Need to Include" recommended content items are applicable across practice settings (e.g., systems screening, patient history) and likely are, or could be, included in other areas of the curriculum. In this case, previously covered content can be efficiently reviewed/applied/integrated during integumentary-specific instruction. Faculty communication and collaboration across entry-level courses is highly encouraged.

The 2023 curriculum recommendations continue a long history of the ACEWM WMSIG working to promote contemporary education for entry-level physical therapists. Early foundational recommendations were created and published 25+ years ago, with revisions in 2008 and 2014, and served as a strong foundation for the 2023 update. The ACEWM appreciates the continued partnership between members, educators, and clinicians working to keep this document applicable to contemporary practice. Thank you to all that have contributed!

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NORMAL TISSUE HEALING

Anatomy of the Skin

Need to Include
Function of skin
Layers of skin, including primary cells & vascular supply

Example lab activity:

- Review burn injury depths (superficial, superficial & deep partial thickness, full thickness, subdermal) based on skin layer involvement & scar risk.

Example learning objectives:

- Identify structural components of the skin.
- Define terms associated with wound depth, including superficial, partial thickness, and full thickness.

Physiology of Healing

Need to Include
Activation of platelets & the process of hemostasis
Growth factors
Normal physiology of tissue healing, including phases of healing & general timeframes
Primary cells
Types of wound closure

Example lab activity:

- Identification of healing phases using wound photographs.

Example learning objective:

- Describe the function of primary cells active in tissue healing to include: platelets, mast cells, neutrophils, macrophages, endothelial cells, fibroblasts, myofibroblasts, & epithelial cells.

Factors That Can Negatively Impact Tissue Healing

Need to Include
Local factors
Nutrition & hydration
Systemic factors

Example lab activity:

- Large & small group discussion to identify complicating factors presented in a case study & how to mitigate.

Example learning objective:

- Provide patient education regarding how factors that may impede tissue healing can be altered.

PSYCHOLOGICAL ISSUES

Possible Concerns

Need to Include	Nice to Include
Barriers to care (e.g., language, resource availability, funding, social support)	Cosmesis & self-image
Effects of chronic illness	Palliative care
Effects of isolation	Sleep
Healthcare expenses & lost wages	
Mental health	
Occupational & lifestyle changes	
Quality of life	
Social habits	
Stress (patient, family, caregiver)	

Example lab activity:

- Identify potential local sources of support for patients, family, or caregiver(s) dealing with psychological issues.

Example learning objective:

- Discuss possible effects of chronic illness including stress, anger, depression, financial stress, isolation, & dependence on a patient's ability to deal with open wounds.

EXAMINATION

Patient History

Need to Include
Allergies & sensitivities, including latex, sulfa, adhesives, etc.
Current condition(s)/chief complaint(s), including patient needs, concerns, & current/prior wound interventions
Employment/work
Family history
General demographics including age, height, & weight
General health status & function, including self-care/ADLs & domestic responsibilities; education; work; & community, social, civic life
Growth & development
Imaging
Injury/disease including onset, mechanism, course of events, symptoms, patient/family/caregiver expectations, and goals
Lab values
Living environment & destination at conclusion of care
Medications (e.g., steroids, antibiotics, anticoagulants, chemotherapy, radiation, insulin, nonsteroidal anti-inflammatory drugs (NSAIDS), analgesics, herbals, home remedies)
Past medical/surgical history (e.g., cardiovascular, endocrine/metabolic, gastrointestinal, genitourinary, previous wounds/dermatologic conditions, musculoskeletal, neuromuscular, & prior hospitalizations)
Social habits & behavioral health risks, including tobacco, alcohol, drug abuse, & fitness
Social history including culture, resources, activities, & support systems

Example lab activity:

- Create a patient evaluation template, complete a full examination including history using wound models and/or simulation activities.

Example learning objective:

- Explain issues surrounding a patient's level of function & mobility & how these factors influence wound healing potential.

Gross Screening of Systems

Need to Include
Cardiovascular
Cognitive
Gastrointestinal
Genitourinary
Integumentary
Lymphatic
Musculoskeletal
Neuromuscular
Pulmonary

Example lab activity:

- Perform basic systems review screening (e.g., vital signs, range of motion, strength, gross motor function, breath sounds, girth, gross postural & skin assessment).

Example learning objective:

- Summarize how wound healing can be negatively impacted by deficits in one or more body systems.

Wound Characteristics

Need to Include	Nice to Include
Classification based on: <ul style="list-style-type: none"> • Depth of tissue destruction • Etiology & wound type, including Wagner Scale & pressure injury staging • Tissue color 	Surface area – Lund & Browder
Drainage/exudate, including type, amount, consistency, & odor	
Photo documentation	
Wound bed/margins, including tissue type, color, quality, presence of anatomical structures, & phase(s) of healing	
Wound dimensions: <ul style="list-style-type: none"> • Depth • Surface area (length x width), including Rule of Nines • Tunneling, sinus tract • Undermining 	

Example lab activity:

- Wound measurements: create wounds in fruit with various shapes, depth, tunnels, & undermining

Example learning objective:

- Perform accurate wound measurement using wound models.

Periwound & Surrounding Skin

Need to Include	Nice to Include
Ecchymosis	Denuded Skin
Edema, pitting edema	Fissures
Epibole	Pruritis
Erythema	Scar assessment scales
Excoriation	Turgor
Fungal infection	Xerosis
Girth	
Hemosiderin staining	
Hyperkeratosis, callus	
Induration	
Lymphedema	
Maceration	
Periwound coloration	
Scarring	
Tenderness to palpation	

Example lab activity:

- Using wound photos, match periwound descriptors & link to possible interventions.

Example learning objective:

- Discuss options for identifying erythema in darkly pigmented skin.

Pain Specific to Open Wounds

Need to Include	Nice to Include
Baker Wong Faces Scale	McGill Pain Questionnaire
Impact of pain on function	
Quality of sleep	
Types of pain: <ul style="list-style-type: none"> • Background • Incident • Neuropathic • Nociceptive/acute • Operative • Procedural 	
Visual Analog Scale (1-10)	

Example lab activity:

- Practice screening for & determining the type of pain during mock patient cases.

Example learning objective:

- Compare & contrast the different types of pain & give examples of how these might be mitigated.

General

Need to Include
Balance
Community, social, civic life
Education & work/life activities
Footwear
Joint integrity
Mobility
Muscle performance
Range of motion
Reexamination, including repeat of selected tests/measures
Self-care, ability to perform basic ADLs
Use of assistive technologies, including offloading devices

Example lab activity:

- Build a template for wound examination including general screens/assessments.

Example learning objective:

- Incorporate general patient screening into wound examination.

Vascular Testing

Need to Include	Nice to Include
Ankle-brachial index (ABI)	Buerger's test
Assess distal pulses	Knowledge only: <ul style="list-style-type: none"> Digital photoplethysmography Lower extremity angiography Toe brachial index Transcutaneous pulse oximetry
Blanch testing	Venous filling time
Capillary refill	WiFi (wound, ischemia, foot inspection)
Rubor of dependency	
Visual inspection	

Example lab activity:

- Perform a full lower extremity noninvasive vascular screen including skin assessment, pulses (femoral, popliteal, dorsalis pedis, posterior tibialis), temperature, capillary refill, Rubor of dependency, & ABI (depending on Doppler availability).

Example learning objective:

- Utilize ABI results when developing an intervention plan for a patient with vascular insufficiency.

Pressure Risk Assessment

Need to Include	Nice to Include
Braden Scale - For Predicting Pressure Sore Risk	Braden Q
Knowledge only: <ul style="list-style-type: none"> Pressure mapping 	Gosnell Scale - For Predicting Risk of Pressure Ulcer
	Norton Pressure Ulcer Risk Scale
	PUSH

Example lab activity:

- Revisit wheelchair assessment (with focus on pressure risk) given various patient mobility scenarios.

Example learning objective:

- Select and perform appropriate risk assessment(s) based on mock patient cases.

Sensory Integrity

Need to Include	Nice to Include
Deep pressure	MNSI (Michigan Neuropathy Screening Instrument)
Kinesthesia	
Light touch	
Position sense	
Semmes-Weinstein monofilament testing	
Sharp/dull	
Temperature	
Vibration	

Example lab activity:

- Assess protective sensation using vibration & monofilament testing.

Example learning objective:

- Perform protective sensation screening of the foot.

Infection

Need to Include	Nice to Include
Infection-related laboratory markers/values	Impact of pharmaceuticals on infection
Signs & symptoms of: <ul style="list-style-type: none"> • Biofilm • Cellulitis • Local & spreading infection • Lymphangitis • Osteomyelitis • Systemic infection & sepsis 	Knowledge only: <ul style="list-style-type: none"> • Fluorescence imaging • Tissue biopsy
Swab cultures	
Tests & measures to identify infection	

Example lab activity:

- Sterile field set up.

Example learning objective:

- Perform a sterile field set up.

Various Wound Diagnoses

Need to Include	Nice to Include
Abscess	Calciphylaxis
Allergic reactions	HIV/AIDS
Burns	Hydradenitis suppurativa
Charcot Foot	MARSI (medical adhesive related skin injury)
Contact dermatitis	Medical device-related pressure injuries
Malignancy, cancer	Mucosal pressure injuries
Neuropathic ulcers	Necrotizing fasciitis
Skin Tears	Peritonitis
Stasis dermatitis	Psoriasis
Surgical	Pyoderma gangrenosum
Traumatic	Rheumatoid
Vascular: <ul style="list-style-type: none"> • Arterial insufficiency • Venous insufficiency 	Scleroderma
	Shingles/Chicken Pox
	Sickle cell disease
	Systemic Lupus Erythematosus
	Vasculitic

Example lab activity:

- Utilize various wound photos & patient histories for differential diagnosis practice.

Example learning objective:

- Differentiate between various types of wounds and correlate wound characteristics with possible etiologies.

INTEGUMENTARY/WOUND MANAGEMENT INTERVENTIONS

Pain Management

Need to Include	Nice to Include
Deep breathing	Home remedies
Distraction	Monochromatic infrared energy
Electrical stimulation	Music
Impact of dressing selection & removal, including moisture retentive	Non-contact ultrasound
Pharmacological: <ul style="list-style-type: none"> • Over the counter • Topical 	Pharmacological: Prescription (IV, intramuscular, oral)
Rapport, empathy	Pain neuroscience education (PNE)
Rest breaks	

Example lab activity:

- Integrate selection & application of pain minimization techniques into case study activities.

Example learning objective:

- Summarize various techniques for minimizing pain during wound interventions.

Infection Control Measures

Need to Include
Aerosolization risks with irrigation & low frequency ultrasound
Cleaning & disinfection of equipment
Hand hygiene, soap & water versus sanitizer
Isolation, including organism-specific (e.g., contact, droplet, airborne)
Sterile versus clean technique
Standard precautions
Use of personal protective equipment (PPE)

Example lab activity:

- Practice donning/doffing gowns, exam gloves, and sterile gloves.

Example learning objective:

- Compare & contrast PPE requirements based on patient history & diagnosis, wound type, & intervention.

Wound Cleansing

Need to Include	Nice to Include
Wound cleansers	Scrubbing
Wound cleansing/irrigation, including type, method, amount, & temperature	

Example lab activities:

- Utilize monojects & catheters to irrigate wound models.
- Practice pulsed lavage with suction (if portable suction is available).

Example learning objective:

- Compare & contrast various methods of wound cleansing, irrigation, & hydration & when each would be appropriate based on wound status.

Debridement

Need to Include	Nice to Include
Methods of debridement: <ul style="list-style-type: none"> • Autolytic • Enzymatic • Mechanical • Sharp (knowledge only) • Surgical (knowledge only) 	Methods of debridement: <ul style="list-style-type: none"> • Biosurgical (maggot - knowledge only) • Chemical • Ultrasound (knowledge only)
Special considerations (e.g., lab values, pain)	

Example lab activity:

- Practice debridement methods using fruit (e.g., oranges, avocados), pig's feet, and/or cadavers.

Example learning objective:

- Compare & contrast various forms of debridement & select when each would be appropriate based on case scenarios.

Non-Antimicrobial Dressings

Need to Include	Nice to Include
Absorbent pads	Burn pads
Calcium alginate	Composite
Collagen	Growth factors
Foam	Skin substitutes
Gauze	
Hydrocolloid	
Hydrofiber	
Hydrogel	
Non-adherent contact layer	
Primary/secondary dressings	
Transparent film	

Example lab activity:

- Demonstration/practice of dressing application on wound models.

Example learning objective:

- Compare & contrast dressing characteristics.

Infection Management

Need to Include	Nice to Include
Antimicrobial dressings, including silver	Cadexomer iodine
Biofilm management	Honey
Debridement to decrease potential/current infection	
Inappropriate use of occlusive dressings in presence of infection	
Topical solutions, including acetic acid, Dakin's solution, hydrogen peroxide, & povidone-iodine	

Example lab activity:

- Practice parameter selection & application techniques of available modalities appropriate for management of infection (e.g., pulsed lavage with suction, wound cleansing/irrigation, electrical stimulation, noncontact ultrasound).

Example learning objective:

- Select appropriate irrigation solutions & dressing(s) for infected wounds based on patient history & wound characteristics.

Biophysical Agents

Need to Include	Nice to Include
Electrical stimulation	Hyperbaric oxygen
Negative pressure wound therapy	Low frequency ultrasound
Pulsatile lavage (with/without suction)	Pneumatic compression
	Shockwave therapy
	Traditional ultrasound
	Ultraviolet light

Example lab activity:

- Practice parameter selection & application of high volt pulsed current electrical stimulation based on various patient scenarios.

Example learning objective:

- Apply negative pressure wound therapy & explain rationale for parameter & dressing decision.

Pressure Redistribution

Need to Include	Nice to Include
Footwear needs & options	Seating/pressure mapping
Management of incontinence	
Mobility training	
Offloading	
Orthotic devices	
Support surfaces	
Therapeutic positioning	

Example lab activity:

- Place colored dots over bony landmarks at highest risk for pressure injury in various positions (e.g., supine, prone) & have students apply offloading principles to mitigate risk.

Example learning objective:

- Identify pressure injury risk factors & describe pressure redistribution techniques & devices appropriate to address these risks.

Other

Need to Include	Nice to Include
Bandaging techniques	Bandaging – Montgomery straps
Compression: <ul style="list-style-type: none"> • Ace wrap • Compression garments • Long stretch • Multi-layer • Short stretch 	Removal of sutures & staples
Control of bleeding	
Exercise prescription	
Knowledge only: <ul style="list-style-type: none"> • Manual lymph drainage • Total contact casting (TCC) 	
Management of incontinence	
Periwound management	
Possible adverse reactions	
Scar management	
Skin care	
Skin sealant/protectant	

Example lab activity:

- Practice figure of eight & spiral wrapping techniques & apply multi-layer compression.

Example learning objective:

- Prescribe an exercise plan based on loss of muscle tissue associated with traumatic injury.

DOCUMENTATION

Need to Include
Daily treatment notes
Diagnosis
Discharge summary
Evaluation
Goals
History
Patient education topics
Plan of care
Prognosis
Re-evaluation
Referrals
Systems review
Tests/measures

Example lab activity:

- Add documentation to existing case studies/patient scenarios.

Example learning objective:

- Utilize correct wound-related terminology in completing accurate, timely wound documentation.

HEALTHCARE PROVIDER RISK

Need to Include
Post exposure procedures
Provider immunizations
Reduction/prevention of infection transmission
Sharps
Standard & isolation precautions, including contact, droplet, airborne (knowledge only)
Tuberculosis & blood borne pathogen standards/training
Use of personal protective equipment (PPE)
Work practice controls/hazard communication

Example lab activity:

- Practice don/doff of PPE.

Example learning objective:

- Describe basic PPE/OSHA standard precautions required in various patient scenarios.

INTERDISCIPLINARY TEAM

Possible Members of a Wound Management Team

Need to Include	Nice to Include
Advanced practice providers (Physician Assistant, Nurse Practitioner)	Diabetic Educator
Case manager	Infection prevention professional
Dietician	Pharmacist
Durable Medical Equipment (DME) Providers	Podiatrist
Nurse	Smoking cessation specialist
Orthotist/prosthetist	
Physical therapist/physical therapist assistant	
Physician/surgeon, from all relevant specialty areas	
Social worker	

Example lab activity:

- Based on patient scenarios, discuss other healthcare professional team members necessary to optimize patient care.

Example learning objective:

- Determine when patient needs extend beyond the scope of physical therapist practice & recommend referral to collaborative healthcare professionals.

WOUND MANAGEMENT BUSINESS & ADMINISTRATION

Exposure to Reimbursement Issues

Nice to Include
Coding: overview of Healthcare Common Procedural Coding System (HCPCS)
Local Coverage Articles (LCAs)
Local Coverage Determinations (LCDs)
Medicare Administrative Contractors (MACs)
National Correct coding Initiative (NCCI)
National Coverage Determinations (NCDs)
Overview of Medicare - Minimum Data Set (MDS)
Patient-Driven Groupings Model (PDGM)
Patient-Driven Payment Model (PDPM)

Example lab activity:

- Utilize LCD information to answer questions about a patient's plan of care.

Example learning objective:

- Summarize various issues related to wound management reimbursement.