

# PHYSICAL THERAPY— GRADUATE (PTGR)

## Courses

### **PTGR 500. Integrative Approach to Early Rehabilitation. 3 Units.**

Advanced study in acute and subacute rehabilitation as it applies to the early intervention of physical therapy. Emphasizes wound care management and treatment; cardiopulmonary assessment and treatment; ECG interpretation; and the evaluation process for acute rehabilitation, including spinal cord injury and stroke. Reviews comprehensive team approach, with utilization of neuropsychology and case management.

### **PTGR 501. Advanced Orthopaedic Specialty Tracks I. 3 Units.**

Presents the newest clinical treatment applications over the spectrum of the patient population in the field of orthopaedic physical therapy. Emphasis on the cervicothoracic spine and the shoulder girdle.

### **PTGR 502. Advanced Orthopaedic Specialty Tracks II. 3 Units.**

Presents the newest clinical treatment applications over the spectrum of the patient population in the field of orthopaedic physical therapy. Emphasizes the thoracolumbar and the lumbopelvic regions.

### **PTGR 503. Medical Documentation and Billing. 3 Units.**

Emphasizes expanded skills in medical documentation and communication in the clinical setting. Includes documentation following Medicare guidelines and the Guide to Physical Therapy Practice, justification of care using measurable objective data, home health episodic payment, billing and reimbursement, workers' compensation, interdisciplinary communication, medical dictation, and electronic medical records and documentation related to physical therapy.

### **PTGR 504. Science and Biomechanics of the Fascia and the Art of Myofascial Release. 3 Units.**

Bridges the science and art of myofascial release to learn clinically and anatomically based approaches to myofascial release. Focuses on how the fascia and muscle create dysfunction in the human body and increase stress to the system, leading to the occurrence of symptoms encountered clinically in the form of common musculoskeletal pathologies.

### **PTGR 505. Orthopaedic Intervention: Regional Interdependency of the Cervical Spine & Upper Extremities. 3 Units.**

Advanced clinical assessment, treatment, and management of orthopaedic disorders of the upper extremities. Emphasis on regional interdependency. Includes biomechanics, examination, and intervention of the cervical spine and shoulder complexes, emphasizing refinement of the cervico-thoracic spine and upper-quarter screen and evaluation. Includes lecture and laboratory.

### **PTGR 506. Soft-Tissue Mobilization. 3 Units.**

Helps practicing physical therapy clinicians optimize skills and refine selection of the most effective soft-tissue mobilization techniques to maximize specific musculoskeletal functional outcomes. Students learn new techniques and refine and master previously learned techniques through lecture, demonstration, practical examinations, and hand-on techniques.

### **PTGR 507. Advanced Pediatric Clinical Practice. 3 Units.**

Physical therapy management of the pediatric patient. Emphasizes observation and analysis of typical development, common movement dysfunctions, and evidenced-based interventions and treatment techniques for the developmentally delayed child.

### **PTGR 508. Current Topics in Neurological Rehabilitation. 3 Units.**

Presents evidence-based physical therapy treatment applications for neurologically impaired patients across the life span. Evaluation and treatment of patients with acquired brain injury, stroke, spinal cord injury, vestibular disorders, diabetic neuropathies, and amputations. Emphasizes designing treatment plans, integrating family training, and maximizing independence using the International Classification of Functioning, Disability and Health (ICF) model.

### **PTGR 509. Function-Based Rehabilitation. 3 Units.**

Evidenced-based course that covers physical therapy practice relevant to adult neurological rehabilitation. Emphasizes NDT, motor learning, and clinical decision making. Exposes students to material through problem-based learning, literature review, lecture, discussion, and intensive hands-on sessions focused on mastery of manual therapy application.

### **PTGR 510. Neurologic Upper Extremity Management. 3 Units.**

Evidenced-based course that covers physical therapy practice relevant to adult neurological rehabilitation. Emphasizes a PNF perspective with a focus on clinical decision making. Exposes students to material through problem-based learning, literature review, lecture, discussion, and intensive laboratory sessions focused on mastery of manual therapy application.

### **PTGR 511. Advanced Clinical Practice I: Orthopaedic Rehabilitation. 3 Units.**

Student demonstrates and practices advanced examination, assessment, and treatment of the lumbar spine, pelvic girdle, and lower extremities. Lecture and demonstration.

### **PTGR 512. Advanced Clinical Practice II. 3 Units.**

Physical therapy management of individuals with vestibular disorders resulting in dizziness and postural instability. Emphasizes application and integration of theoretical constructs, evidenced-based practice, examination, evaluation, diagnosis, prognosis, intervention, and outcomes measurement. Learner-centered pedagogy requiring considerable weekly preclass preparation.

### **PTGR 513. Advanced Clinical Practice III. 3 Units.**

Advanced clinical decision-making skills, with focus on patient classification, clinical-diagnosis practice parameters, and practice guidelines. Emphasizes development of clinical algorithms, clinical prognostic skills, and outcome measures.

### **PTGR 514. Professional Systems in Management I. 3 Units.**

Administering the academic department: personnel selection, development, and evaluation; finance; team development; and leadership theories.

### **PTGR 515. Cardiopulmonary Approaches to Assessment, Wellness, and Disease. 3 Units.**

Review of pathology, etiology, and clinical manifestations of cardiopulmonary disorders encountered by physical therapists. ECG interpretation and assessment. Management of patients/clients at risk for chronic vascular disease. Overview of the epidemiology, risk factors, assessment, and interventions which address risks and negative health effects of metabolic syndrome. Emphasizes evidence-based research to guide the development of assessment, prevention, and intervention strategies.

**PTGR 516. Movement Science of the Upper Quarter. 3 Units.**

Presents pathomechanics of spine and upper extremity injuries. Explores the role of muscular imbalance in the pathogenesis of orthopaedic disorders of the upper quarter, and how faulty biomechanics contribute to injuries. Diagnosis, analysis, and evaluation of normal and abnormal movement patterns. Development and design of specific interventions aimed at changing movement dysfunctions of the upper quarter.

**PTGR 517. Movement Science: Lower Quarter Biomechanical Relationships. 3 Units.**

Presents pathomechanics of lumbar spine and lower extremity injuries. Explores the role of muscular imbalance in the pathogenesis of common orthopaedic disorders of the lower quarter and how faulty biomechanics can contribute to injuries. Diagnosis, analysis, and evaluation of normal and abnormal movement patterns. Development and design of specific interventions aimed at changing movement dysfunctions of the lower quarter.

**PTGR 518. Topics in Rehabilitation. 1-6 Units.**

Lecture and discussion of current topics relating to the practice of physical therapy. Content varies from quarter to quarter. (May be repeated for additional credit for a maximum 6 quarter units.).

**PTGR 519. Home Health Physical Therapy for the Post-Acute Patient. 3 Units.**

An in-depth course for physical therapy students interested in the home health setting. Special emphasis on Medicare guidelines and the requirements necessary to excel in this progressive and growing setting.

**PTGR 520. Cervical Spine. 3 Units.**

Evaluation and treatment of patients using best practices and advanced orthopedic skills for the cervical spine. Differentiates clinical conditions and enhances clinical decision making. Integrates manual therapy into patient care. Links clinical practice guidelines to the International Classification of Functioning, Disability, and Health for impairment and function-based diagnosis, examination, and intervention.

**PTGR 521. Lumbar Spine. 3 Units.**

Evaluation and treatment of patients using best practices and advanced orthopedic skills for the lumbar spine. Differentiates clinical conditions and enhances clinical decision making. Integrates manual therapy into patient care. Links clinical practice guidelines to the International Classification of Functioning, Disability, and Health for impairment and function-based diagnosis, examination, and intervention.

**PTGR 522. Assessment and Management of the Knee. 3 Units.**

Evaluation and treatment of patients using best practices and advanced orthopedic skills for musculoskeletal conditions of the knee. Differentiates clinical conditions and enhances clinical decision making. Integrates manual therapy into patient care. Links clinical practice guidelines to the International Classification of Functioning, Disability, and Health for impairment and function-based diagnosis, examination, and intervention.

**PTGR 523. Advanced Neurological Rehabilitation. 3 Units.**

Studies in-depth the patient with spinal cord injury, including etiology, current treatment techniques in acute and outpatient settings, and principles of exercise physiology. Reviews research activities with regard to a cure for spinal cord injury, as well as the legal aspects of ADA and the individual with a spinal cord injury.

**PTGR 524. Women's Health Issues I. 3 Units.**

Clinical aspects of women's health issues. How to develop a women's health program in the clinical setting. Introduces various pathologies and treatment strategies for specific diagnoses that could be encountered in the clinical setting. Women's health during adolescence, the reproductive years, and the geriatric years.

**PTGR 525. Women's Health Issues II. 3 Units.**

Advanced course further exploring women's health issues—including treatment strategies for women during various phases of their lives. Anatomy and physiology during adolescence, the reproductive years, and the geriatric years.

**PTGR 526. Health-related Quality of Life and Health Satisfaction in Health Care. 3 Units.**

Involves students in the incorporation of Loma Linda University's motto, "To make man whole," as a critical aspect of improving quality of life. Emphasizes ways to improve quality of life in aging and disabled populations. Uses quality-of-life and health-satisfaction instruments and outcomes to inform students' decision making and patient care across the life span and as an indicator of successful aging. Students develop a quality-of-life intervention program.

**PTGR 527. Skilled Nursing Facility Physical Therapy Practice, Interventions and Outcomes. 3 Units.**

Orientation to the skilled nursing clinical setting. Topics include, Medicare, Medicaid/Medi-Cal, and private insurance billing and regulations; resource utilization groups; common patient populations; treatment strategies; and, outcome measurements. Discussion and integration of evidence-based practice maximizing outcomes, compliance, and patient satisfaction.

**PTGR 528. Residency Level Advanced Seminars. 1 Unit.**

Accurate interpretation of emerging evidence with applications to physical therapy conditions. Contextually incorporates traditional classroom instruction, group activities and projects, case presentations, live demonstrations, case-based problem-solving sessions, and role-play activities into the clinical setting. Preparation for specialization certification by the American Board of Physical Therapy Specialists.

**PTGR 529. Integumentary and Lymphatic Systems: Evaluation and Intervention. 3 Units.**

Provides physical therapists with knowledge and skills to identify patients at risk for development of integumentary and lymphatic complications; to prescribe preventive measures to promote skin and lymphatic integrity; and to treat conditions once they develop.

**PTGR 531. Advanced Orthopaedic Procedures I. 3 Units.**

Student demonstrates and practices advanced examination and treatment of the lumbar spine, pelvic girdle, and lower extremities.

**PTGR 532. Advanced Orthopaedic Procedures II. 3 Units.**

Student demonstrates and practices advanced examination and treatment of the cervical spine, shoulder girdle, and upper extremities.

**PTGR 533. Advanced Orthopaedic Procedures III. 3 Units.**

Student demonstrates and practices advanced examination and treatment of the lumbar spine, thoracic spine, and rib cage.

**PTGR 534. Sensory Integration Disorders. 3 Units.**

Exploration of sensory integration disorders—including nystagmus, fluid abnormalities of the inner ear, and physical therapy management of individuals with chronic motion sensitivity and cervicogenic dizziness. Course emphasizes application and integration of theoretical constructs and evidenced-based practice. Prerequisite: PTGR 512.

**PTGR 535. Sensory Integration Disorders II. 3 Units.**

Explores sensory integration disorders and clinical applications. Emphasizes fluid abnormalities of the inner and middle ear, cervicogenic dizziness, theoretical constructs, and evidence-based practice. Learner-centered hybrid course pedagogy includes three on-line and two face-to-face classes. Prerequisite: PTGR 534.

**PTGR 536. Sensory Integration Disorders III. 3 Units.**

Explores sensory integration disorders and clinical applications. Emphasizes the neurophysiology of nystagmus, push-pull system, Ewald's laws, and dynamic visual acuity testing. Learner-centered hybrid-course pedagogy that includes three on-line and two face-to-face classes. Prerequisite: PTGR 534.

**PTGR 550. Introduction to Psychoneuroimmunology: The Science of Whole Person Care. 3 Units.**

Studies the effect of the neurological system on physical health, with a focus on psychoneuroimmunology. Summarizes scientific disciplines that study brain, immune system, and health behavior interactions that provide the health-care professional with an integrative understanding of lifestyle, whole person care for immune system function, and wellness.

**PTGR 551. Clinical Translation of Pain Science. 3 Units.**

Overview of pain science; including, chronic pain, the neurobiology of pain, pain mechanisms, psychological and cognitive aspects of pain, and measurement and assessment of pain. Examines neuropathic pain and its contribution to the "centralized pain" component and cognitive behavioral therapies. Discusses pharmacology concepts that help "retrain the brain" in patients suffering acute pain, while preventing the progression to chronic pain.

**PTGR 552. Pain Science: Interactions of the Brain and Body. 3 Units.**

Study of the transition from acute to chronic pain states. Distinguishes among peripheral neurogenic, central, and somatic pain mechanisms, and provides a foundation for the management of pain disorders through clinical decision-making. Utilizes functional MRI and neurocognitive function to recognize relationships among the brain, personality disorders, and acute and chronic pain.

**PTGR 553. Clinical Reasoning and Critical Thinking in Physical Therapy. 3 Units.**

Examines aspects of the "cognitive engine" related to evaluation, management, and decision-making for orthopaedic physical therapy patients. Develops use of goal-directed thinking, and analytical and evaluative questioning. Supports data gathering and interpretation, evaluation methodology, treatment planning and execution, and prognosing. Provides support for defending, justifying, and rationalizing clinical decisions.

**PTGR 554. Writing for the Physical Therapy Professional and Educator. 3 Units.**

Develops clear, precise, and audience appropriate writing skills. Links practical applications to common writing situations found in the health professions and education, ranging from intradisciplinary written communication to preparing abstracts and manuscripts for submission.

**PTGR 555. Grant Writing for Health Professionals. 3 Units.**

Addresses proposal-writing skills essential for acquiring competitive grant funding from government agencies and private foundations. Includes content knowledge, writing proficiency, research skills, originality, creativity, alignment with agency guidelines, and development and submission of a compelling proposal.

**PTGR 556. Research and Journal Club Seminars. 1 Unit.**

Presents novel and developing topics in the field of rehabilitation and medicine. Provides interactions with well-established and emerging investigators. Encourages state-of-the-art approaches and thinking in rehabilitation scholarship, with emphasis on physical therapy research and innovations.

**PTGR 557. Doctoral Dissertation Seminar. 1 Unit.**

A year-long course that assists doctoral students with development of dissertation chapters through the oral defense of the dissertation. Emphasis on the literature review, research design, committee formation, institutional review board training, time and project management, framing of chapters, dissertation format standards, and dissertation defense etiquette.

**PTGR 570. Muscle Energetics and Biochemistry. 3 Units.**

Surveys biochemistry and metabolic pathways related to muscle function during exercise and at rest. Includes muscle biochemistry, glycolysis, gluconeogenesis, beta oxidation, protein metabolism, and nutritional requirements of the cell. Emphasizes metabolic, cardiac, pulmonary, and neurological disorders that limit optimal muscle function and development of physical therapy protocols to minimize limitations. Covers prerequisites in organic and cellular chemistry.

**PTGR 571. Advanced Physiology I: Neurobiology. 3 Units.**

Surveys cell and whole-body physiology. Includes physiology of the neuron and nerve conduction, molecular transport at the cellular level, cardiovascular and renal physiology, gastrointestinal physiology, endocrinology, and neurophysiology. Emphasizes muscles and neurophysiology as they relate to the cardiovascular, respiratory, and endocrine systems.

**PTGR 572. Advanced Physiology II: Exercise and Thermoregulation. 3 Units.**

Focuses on energy sources utilized by the body for exercise, neural and mechanical structures of mechanisms that control body movements, environmental influences on exercise performance, the physiology of thermoregulation, and principles of aerobic and anaerobic exercise. Applies concepts and principles to normal and disabled human conditions.

**PTGR 573. Pathokinesiology of Gait. 3 Units.**

Advanced observational analysis of normal and abnormal human locomotion, with comparison of pathological differences.

**PTGR 574. Current Issues in Basic Science. 3 Units.**

Studies the current issues in basic science, as related to physical therapy. Topics may include current advances in biomechanics, cell and molecular biology, tissue engineering and transplants, pharmacology, and presentation of basic science research. Content includes scientific literature reviews and participation in a wet lab activity that includes development of a question or hypothesis and experimental plan, possible execution of the plan, and interpretation of results.

**PTGR 577. Pharmacology in Physical Therapy. 3 Units.**

Principles of pharmacology as related to diagnosis, prevention, and treatment of disease, including a presentation of the pharmacology and therapeutic value of drugs used in rehabilitation medicine. Related topics include pharmacokinetics, pharmacodynamics, adverse effects, drug interactions, and drug toxicity—with special consideration given to pediatric and geriatric pharmacology.

**PTGR 578. Medical Screening for Physical Therapists. 3 Units.**

Screening for nonneuromusculoskeletal origins for the musculoskeletal complaints of patients who commonly seek rehabilitation in the physical therapy setting. Particularly emphasizes components of the history and physical examination that suggest medical pathology requiring a medical referral. Knowledge and skills related to screening for medical pathologies of the 11 body systems in patients with musculoskeletal complaints of the thorax, pelvis, spine and extremities.

**PTGR 579. Clinical Imaging for Physical Therapist. 3 Units.**

Explores modern imaging techniques used to assess musculoskeletal disorders and cardiovascular pathologies. Includes radiographs, CAT scans, MRIs, bone densitometry, PET scans. Emphasizes clinical ultrasound imaging as used in physical therapy.

**PTGR 580. Movement Science: Bio-control. 3 Units.**

Emphasizes application and discussions of the contemporary knowledge of motor control and learning to individuals with movement dysfunctions.

**PTGR 584. Functional Magnetic Resonance Imaging. 3 Units.**

Introduces students to the techniques applied in functional magnetic resonance imaging and their applications. Covers the theoretical basics of MRI, different types of techniques and software used for processing, group analysis, and interpretation of results.

**PTGR 585. Three-dimension Medical Imaging Quantitation. 3 Units.**

Introduces basic principles of medical imaging as they relate to volumetrics and 3D rendering. Topics include: concept of the voxel, 3D image generation, multiplanar reformat measurements, segmentation, and data presentation. Hands-on experience with 3D imaging software that teaches common toolsets for 3D processing. Prerequisite: PTGR 584.

**PTGR 586. MATLAB. 3 Units.**

Discusses general programming concepts; different ways to plot, visualize, and explore data; and typically used toolboxes and functions in MATLAB.

**PTGR 590. Political Advocacy and Health Policy for Physical Therapists. 3 Units.**

Focuses on health-care advocacy at the national, state, grassroots, and local levels as it promotes the interests of patients, professionals, and organizations involved in health-care delivery. Students examine and discuss policy issues and strategies relevant to physical therapists and other health professionals and educators; and learn a systematic, comprehensive approach to political advocacy and policy activism.

**PTGR 591. Biomechanics I. 3 Units.**

Reviews classic concepts in biomechanics at the tissue, joint, and whole body level. Provides a basic understanding of classic and current biomechanical research and how to interpret/synthesize this research. Explores topics related to muscle and tendon function/dysfunction, joint lever biomechanical demands and function, and whole body analysis of human movement. Facilitates the development of theoretical framework for biomechanical research questions.

**PTGR 592. Biomechanics II. 3 Units.**

Reviews methodologies related to the biomechanics of human movement. Areas of focus include kinematics, kinetics, energetic, inverse dynamics, data processing and interpretation, and muscle force measurements. Focuses on the interpretation of kinematic, kinetic, and energetic data and appropriate measures to quantify movement. Facilitates the development of methods to test biomechanical research questions and apply biomechanical concepts to the clinical environment. Prerequisite: PTGR 591.

**PTGR 594. Evidence-Based Practice in Physical Therapy. 2 Units.**

A structured overview of evidence-based practice (EBP) for the advancement of physical therapy practice as well as research-supported strategies for implementing EBP in real world clinical settings.

**PTGR 599. Comprehensive Examination. 0 Units.**

Required written examination to be completed at the end of the second didactic year for the Doctor of Science degree and the Doctor of Philosophy degree in physical therapy science. Comprehensively evaluates student's knowledge in four domains without the assistance of outside resources: education, research, clinical practice/science, and ethics/professionalism. Successful completion required for continuation in the program. Prerequisite: AHCJ 599; AHRM 581, AHRM 582.

**PTGR 690. Research Rotations. 1-3 Units.**

Involves students in the research and discovery culture of the University and clinical settings through observation of and/or participation in ongoing faculty research and grant projects; as well as graduate student research projects. Includes research data-collection equipment, mentorship, dissertation defenses, research-finding presentations, and/or pilot studies that students design for this practicum experience.

**PTGR 693. Research and Statistics III: Development and Approval of Research Topic and Questions. 3 Units.**

Research-topic selection, development of research questions, literature review, oral defense of research topic, questions and proposed research design, and approval. Prerequisite: AHRM 582.

**PTGR 694. Proposal Development and Institutional Review Board Approval. 3 Units.**

With oversight by the research guidance committee, student develops a written research proposal that describes the problems to be investigated, the hypotheses and assumptions to be developed, and the proposed experimental design; and that subsequently is submitted to the Office of Sponsored Research for Institutional Review Board approval. Prerequisite: PTGR 693.

**PTGR 695. Research and Statistics V: Data Collection. 3 Units.**

Research data planning, setup, standardization of procedures, collection, electronic data capture, management, and storage leading to dissertation.

**PTGR 696. Research and Statistics VI: Data Analysis. 3,6 Units.**

Individual arrangements for doctoral students to work with their research guidance committee on analysis and presentation of research data. Student prepares manuscript presenting results of doctoral research study.

**PTGR 699. Research and Statistics VII - Dissertation. 3 Units.**

Individual arrangements for doctoral students to work with their dissertation chair and research guidance committee to submit a substantial and acceptable preliminary written doctoral dissertation—either in the traditional formal dissertation or multiple chapter format—in accordance with published guidelines of the Faculty of Graduate Studies, and in the format of the journal in which the candidate hopes to publish. Students prepare and present an oral defense of their research findings.