BROOKS Rehabilitation
INSTITUTE OF HIGHER LEARNING | Pediatric Residency Program

Curriculum

Classroom Hours (CH)

Class Series	Class Titles	Time
Residency Foundations	Orientation & Introduction to Residency	8 CH
	Pain	6 CH
	Scholarly Integration I, II, III	9 CH
	Clinical Reasoning	4 CH
	Clinical Research: Case Reports	3 CH
	Foundations: IHL Pillars Discussions 1-5	10 CH
	Patient Centered Communication	2 CH
	Implementation Science	3 CH
	Motor Control Collaboration	8 CH
	Motion Analysis Center	3 CH
	Clinical Systems Based Presentations	4 CH
Pediatric Practice Foundations	Peds Orientation, Motor Development and Adaption, Social Determinants of Health, Pediatric EBP and Research Principles, Pediatric Client Evaluation, Screening and Outcome Measures, Movement Analysis, Motor control and learning	33 CH
Advanced Pediatric Patient Management	Pediatric Intervention, Play, Infant Development and Handling, Locomotor Development and training, Pediatric Equipment, Pain, Obesity and Wellness/Fitness, Manual Therapy	58 CH
Specialty Management of the Pediatric Patient	Aquatics, Practice Models, Settings, Education, Community Integration, Transition to Adulthood, Advocacy/Leadership and Legal Issues, Alternative Medicine and therapies	36 CH
Diagnoses Series: System Development	System Development Review: MSK, Neuro, Cardiopulmonary, Integumentary, Other Systems	3 CH
Diagnosis Series: MSK	Case-based learning and application on pediatric diagnoses for the complex pediatric patient with MSK conditions	27 CH
Diagnosis Series: Neuro	Case-based learning and application on pediatric diagnoses for the complex pediatric patient with neurologic conditions	22 CH
Diagnosis Series: Cardiopulmonary	Case-based learning and application on pediatric diagnoses for the complex pediatric patient with cardiopulmonary conditions	8 CH
Diagnosis Series: Integumentary and Other Systems	Case-based learning and application on pediatric diagnoses for the complex pediatric patient with Integumentary, GI and other sensory system involvement	25 CH
Differential Diagnosis Series	Case-based learning and application on pediatric diagnoses for the complex pediatric patient focused on screening and differential diagnosis of common physical therapy evaluations	16 CH

CEU	Advanced NPT Management of the Patient Post CVA	18 CH
CEU	Advanced NPT Management of the Patient Post SCI	16 CH
CEU	Advanced NPT Management of the Patient Post TBI	16 CH
CEU	Spasticity Management and Serial Casting	8 CH
CEU	Vestibular Rehab 1: Foundations and Contemporary Practice	16 CH
CEU	Gait Analysis	8 CH
CEU	Therapeutic Exercise Dosing for the Musculoskeletal Impairments	16 CH
CEU	Pediatric Behavior Management	8 CH
CEU	APTA Clinical Instructor Credentialing Course	16 CH
BPRP 890**	Nonviolent Crisis Intervention	4 CH
DLA Classroom Activities	Reflective Narratives	12 CH
	Effective Communication: Live Simulation	3 CH
	Total Hours	**429 CH**

Directed Learning Hours (DLH)

Specialty Clinic (Pain, UF, etc)	16 DLH
Brooks Motion Analysis Center	4-8DLH
Equipment Clinic	4 DLH
Pediatric Day Program	16 DLH
Bumps and Bruises Clinic	4 DLH
School Based Observation	50-72 DLH
Early Steps (Early Intervention) Observation	50-72 DLH
Peer Residents (4 hours with each classmate)	8 DLH
Other Resident (4 hours with one resident from other program)	4 DLH
Halifax Specific Observation	8 DLH
Other Setting Observation-Resident Interest	20 DLH
GoBabyGo Community Service Activities	30 DLH
Provider Relations Activities	4 DLH
Total:	**262**

Scholarly Hours

Written Case Studies (2)	46 SH
Case Study Presentations (4)	20 SH
Cased-based Presentations (2)	10 SH
Attend Journal Clubs, Present 1 article, Create 1 Article Summary	16 SH
Classroom Teaching (including prep time)	25 SH
In-services	4 SH
Research Activities	25 SH
Total:	**146 SH**

Directed 1:1 Clinical Mentoring (150 Hours)

Serve as Clinical Instructor for a DPT Student (320 Hours)

Total Hours

Total Patient Care Hours	1675
Total Educational Hours	837
Total Program Hours	**2512**

Brooks Residency & Fellowship Foundations Course Overview:

This course will present concepts related to several components of practice for residents and fellows that are applicable across areas of specialization. The classes in this course will be attended by the Physical Therapy Residents and Occupational Therapy Fellows in an academic cohort including several specialties (Neurology, Pediatrics, Orthopaedics, Sports, Women's Health, Geriatrics). Residents/Fellows will learn: knowledge and skills germane to effective, self-monitored clinical reasoning in the context of multidisciplinary clinical practice; the principles of clinical inquiry, specifically related to the development of clinically related questions and the process of answering the developed questions; the knowledge and skills to develop written and oral case presentations; concepts related to pain science, including the identification and assessment of pain; the value of incorporating vital signs into patient management across settings and specialties; knowledge and skills to promote positive patient centered communication; concepts and skills for the development of quality improvement and implementation science projects; motor control concepts across varying clinical paradigms; skills to improve one's ability to teach, instruct, and guide the development of a professional student; a deeper understanding of the Brooks IHL Pillars (Advanced Clinical Competence, Professionalism, Practice Management, Scholarship, Education) including application to their professional practice; knowledge and skills from classmates/specialties that will enhance their ability to communicate with and care for their patients.

Course Objectives:

Clinical Reasoning

1. Understand and define clinical reasoning
2. Describe clinical reasoning theories
3. Recognize types of bias within clinical reasoning
4. Learn skills to apply and improve your clinical reasoning

Scholarly Integration I, II, III

1. Demonstrate ability to develop a clinically meaningful question
2. Demonstrate ability to efficiently answer clinical questions
3. Differentiate study critical appraisal process by type of publication
4. Interpret common statistical terms used for reporting within publication types
5. Apply critical appraisal process to disseminate study findings and inform your clinical practice

Case Reports & Presentations

1. Understand the advantages of contributing case reports to the professions body of knowledge
2. Describe the limitations of case reports within the hierarchy of evidence
3. Develop an understanding of the steps involved with writing a case report or oral case presentation.

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Pain & Rehabilitation

1. Recognize value of pain assessment across clinical disciplines and settings
2. Distinguish different types of pain
3. Describe different pain theories
4. Describe variability in pain perception
5. Distinguish between different clinical assessment methods.

Patient Centered Communication

1. Define elements of patient centered communication
2. Understand value of incorporating PROs into patient centered care
3. Define and apply shared decision making
4. Understand how non-specific effects an impact a patient's outcome and satisfaction

Implementation Science & Quality Improvement

1. Identify convergent and divergent themes
2. Identify common methods and strategies
3. Develop mock group projects related to area of clinical interest

Motor Control Collaboration

1. Gain a comprehensive and high level knowledge and appreciation of motor control concepts
2. Understand how such concepts are implemented from differing clinical paradigms or perspectives
3. Discuss and understand how perspectives and frameworks might differ in varying clinical situations

CEU APTA Credentialed Clinical Instructor Program

1. *APTA:* Plan and prepare for physical therapy students during their clinical education experience.
2. Support continuing education through questioning and effective feedback.
3. Acquire performance evaluation skills.
4. Identify and manage students with exceptional situations.
5. Recognize legal implications for clinical educators, including issues presented by the Americans with Disabilities Act.

Brooks IHL Pillar Discussions

1. Describe the Residency/Fellowship graduate expected outcomes related to each pillar
2. Apply concepts from each pillar to clinical and professional scenarios

Revised 06/2025

3. Understand perspectives and paradigms of colleagues from other specialties, settings, and professions

Leadership

1. **ADD INFO**

Clinical Systems Based Presentations

1. Develop and deliver presentation/s to residents and fellows from other specialties
2. Understand the nuances of a colleagues specialty as it applies to your specialty population
3. Develop an understanding for when it is appropriate to consult, and/or refer to a colleague with a different specialization

Instructors:

Jason Beneciuk PT, DPT, PhD, MPH
Michael Braun MSOT, OTR/L, BCPR
Stephanie Bush PT, DPT, Med, WCS
Sara Cristello PT, DPT, OCS, FAAOMPT
Trent Harrison PT, DPT, OCS, FAAOMPT
Devin Jourde PT, DPT, SCS, CSCS
Jessica Magee PT, DPT, WCS
Raine Osborne PT, DPT, EdD
Bob Rowe PT, tDPT, MHS, DMT
Caroline Scott PT, DPT, PCS, CSCS
Ryan Vickers PT, DPT, OCS, FAAOMPT
Geoff Willard PT, DPT, NCS, CSRS
Mark Bowden *****
Current PT Residency and OT Fellowship cohorts

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Continuing Education Courses

Course Description:

This course includes several continuing education courses taught by clinical experts. Each course addresses special topics that cross all specialty areas and can be related to pediatric conditions that would be addressed by a pediatric specialist. Residents will learn advanced assessment and evaluation skills in a variety of special topic areas, along with intervention and patient management strategies.

Advanced Clinical Practice of the Stroke Patient: Gait and Movement Analysis for Targeted Treatment and Maximal Recovery

Course Instructor:

Speaker: Walt Weiss, PT, MPT, NCS, KEMG

Course Objectives:

1. Perform a detailed observational gait analysis for persons with neurologic deficits
2. Classify individuals with stroke into one of 4 cluster-analysis groupings
3. Prioritize gait deviations and problems for targeted treatment of movement dysfunction
4. Utilize the Rancho ROADMAP to assist decision-making for orthotic intervention after stroke
5. Identify evidence-based treatment interventions for individuals with hemiparesis from stroke

Advanced Clinical Practice of the Stroke Patient: Gait and Movement Analysis for Targeted Treatment and Maximal Recovery

Course Instructors:

Julie Braun, PT, DPT, NCS
Michael Braun, MOST, OTR/L, BCPR
Kate Cavka PT, NPT, NCS

Course Objectives:

1. Demonstrate a thorough understanding of expected functional outcomes for each level of spinal cord injury and develop a comprehensive, interdisciplinary plan of care.
2. Educate patients in preventative care topics such as skin care and wound prevention, functional ROM and positioning, preservation of shoulder and hand function, as well as autonomic dysreflexia, heterotopic ossification, and other preventable sequelae.
3. Describe therapy's role in bowel and bladder management for the person with a SCI.
4. Gain increased confidence in mat work when developing preliminary skills training sessions for individuals with SCI.

5. Identify appropriate intervention progression and goals aiming for early recovery in acute care with the end goal of return to community and enhanced quality of life.

Functional Application of Evidence Based Practice in Individuals Following Brain Injury

Course Instructors:

Alyssa Findlay, PT, DPT
Ryan Patterson, MOT, OTR/L, BCPR

Course Objectives:

1. Identify neuroanatomical pathology related to clinical presentation
2. Identify primary and secondary effects of brain injury
3. Discuss medical and pharmacological management relative to acute brain injury and promoting recovery
4. Review issues related to the aging brain injury
5. Review new data in brain injury management
6. Explain presentation and treatment strategies of all levels of brain injury using the Ranchos Los Amigos scale
7. Identify underlying impairments affecting primary functional limitations observed as well as strategies to address and treat those
8. Develop treatment plan inclusive of outcome measure and behavior shaping strategies for individuals fowling brain injury
9. Evaluate patients following brain injury of appropriate comprehensive treatment planning

Therapeutic Management of Tone and Spasticity in Children and Adults with Neurologic Impairments

Course Instructor
Caroline Scott, PT, DPT, PCS, CSCS

1. Describe the difference between tone and spasticity
2. Describe evidence for medical, surgical, and therapeutic interventions for tone and spasticity
3. Discuss appropriate ways to measure tone and spasticity
4. Compare outcomes of interventions related to function
5. Apply serial casting application to upper and lower extremities
6. Demonstrate knowledge of appropriate patient and after care for casting application
7. Accurately assess a patient with abnormal tone or reflexes
8. Develop appropriate treatment goals for a patient with tone or spasticity
9. Assess for appropriateness of serial casting in a patient with tone or spasticity

Vestibular Rehabilitation I: Foundations & Contemporary Practice Course Instructor
Geoff Willard, PT, DPT, NCS, CSRS

Objectives

1. Understand the anatomy and physiology of the vestibular system
2. Describe the pathophysiology of common vestibular disorders
3. List the most common diagnoses/causes of vestibular dysfunction
4. Recognize the clinical presentation of the most common causes of vestibular dysfunction including
    a. History/Subjective Complaints
    b. Objective Tests and Measures
4. Correctly perform common vestibular/balance objective measures including
    a. Dix Hallpike and Roll Test
    b. Oculomotor Exam
    c. Head Thrust Test
    d. Dynamic Visual Acuity
    e. Functional Gait Assessment
5. Identify peripheral, central and non-vestibular causes of dizziness
6. Understand the compensation process following a vestibular disorder
7. Prescribe appropriate rehabilitation programs to address compensation for vestibular dysfunction including HEP's, patient education and ways to progress treatment
8. Accurately assess and perform appropriate canalith repositioning maneuvers for the various forms of BPPV
9. Identify red flags and when to refer for further diagnostic testing

Clinical Gait Analysis

Course Instructor
Mary Mohay, PT, DPT, NCS
Ryan Vickers, PT, DPT, OCS, FAAOMPT

Objectives

1. Discuss a biopsychosocial framework for clinical gait analysis including:
    a. a. Definitions
    b. Integration of the ICF Model
    c. Assessment
    d. Nomenclature
2. Identify and apply outcome measures related to clinical gait analysis including selection, administration and interpretation.
3. Identify the parameters of normal gait.
4. Identify pathologic mechanisms of gait.
5. Identify common gait deviations such as:
    a. Those at the ankle, foot, knee, hip, pelvis, and trunk.
    b. Those common to adult neurologic dysfunction

Therapeutic Exercise Dosing for Neuromusculoskeletal Patients

Course Instructor
Robert Rowe, PT, DPT, DMT, MHS, FAAOMPT

Objectives

1. Define anatomy, biomechanical, motor control, and neuroplasticity nomenclature as it relates to exercise dosing.
2. Describe the composition, mechanism of injury, and optimal stimulus for regeneration for the various connective tissues.
3. List, describe, discuss, and perform the optimal dosed stimuli for rehabilitation of patients with primarily neuromusculoskeletal impairments
4. Prescribe a specific dose of exercise based on the neuromusculoskeletal impairment and the goals of the treatment.
5. To design specific exercise progressions by performing exercises/activities related to revascularization/regeneration, motor control, endurance, speed, strength, and function to promote a strong foundation, capacity and improved performance.

Pediatric Behavior Management

Course Instructor
Sandy Brown, Caroline Scott

Objectives

1. Describe ABA theoretical foundations and principles
2. Identify the connection of ABA to the ICF-CY
3. Describe the ABCs of behavior
4. Describe what increased and decreases behavior
5. Determine 4 possible causes/functions of inappropriate behavior
6. Recognize how to respond to behavior bases upon causes
7. Shape or modify behaviors
8. Manage antecedents (settings/triggers)
9. Document and monitor behaviors

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Course Syllabus

Pediatric Practice Foundations

Course Description: This course provides valuable information to the Resident regarding the foundational framework for growth and development including gross motor, fine motor, locomotion, language, cognition, social, and emotion. This course will review theoretical influences for the pediatric therapists across all populations, review evaluation and data collection. Movement analysis across development to promote active play will be an education framework in this course. This course will also provide current theory and approach to motor development, motor learning and postural control as it relates to the pediatric population.

Course Faculty:
Caroline Scott PT, DPT, PCS
Jessie Kristof, PT, DPT, PCS
Marissa Slate, DP, DPT, PCS
Guest speakers as assigned

Contact Hours:
Lecture (synchronous and asynchronous) and lab 33 Hours

Outline of Content:

Session 1/8:	
Orientation to Pediatric Residency	3 CH
Session 2/8:	
Motor Development and Adaption	4 CH
Session 3/8:	
Social Determinants of Health	3 CH
Session 4/8:	
Pediatric EBP and Research	3 CH
Session 5/8:	
Pediatric Client Evaluation	8 CH
Session 6/8:	
Screening and Outcome Measures	4 CH
Session 7/8:	
Pediatric Movement Analysis	4 CH
Session 8/8:	
Motor Learning and Motor Control	4 CH

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Resident Objectives
At the completion of this course the resident will be able to:

1. Describe current theories of motor development and identify principles that apply to all motor development and incorporate into appropriate intervention selection
2. Explain gross motor development in pediatrics including:
    a. Neuromotor development and sensory integration/processing, including analysis and interpretation of age- and gender-appropriate development and sensory integration and processing.
    b. Reflex integrity, including examination, analysis, and interpretation of various reflexes over time
    c. Identify factors that influence development intrinsically and extrinsically
3. Discuss development of postural control system and identify factors that influence postural control
4. Complete a research activity utilizing critical inquiry within the pediatric community
    a. Explain the differences in principles of qualitative and quantitative research designs
    b. Understand how principles of measurement can influence clinical practice, including:
        i. Sensitivity and specificity.
        ii. Reliability.
        iii. Validity.
        iv. Statistical inference.
    c. Analyze statistics:
        i. Parametric and nonparametric data.
        ii. Descriptive statistics.
        iii. Statistical testing (e.g, analysis of variance, analysis of frequencies, correlation, regression) concepts and applications to research interpretation.
5. Concepts and application of statistical power to research design and interpretation.
6. Discuss Precision Medicine, Epigentics and the role it may play in the PT profession
7. Review participation in the ICF model and how that translates into measurement in the clinical practice
8. Review the relationship of motor control and participation – discuss the relationship to community and belonging
9. Understand the role social determinants of health play in pediatric outcomes and community participation
10. Analyze how social determinants of health influence prognosis
11. Analyze our own implicit biases and our influence on social determinants of health to improve outcomes for our patients
12. Complete an efficient and effective pediatric examination including:
    a. Perform an interview, collect a systematic history and develop a plan for screening or evaluation with a pediatric patient

i. Identifying, reviewing and interpreting all available patient or client data and contextual factors through the ICF model to determine the clinical significance to physical therapy care

b. Systems Review
   i. Understanding of diseases or conditions of the organ systems that may necessitate physical therapist services, that affect systems that in turn necessitate physical therapist services (i.e., comorbidities), and that influence the type of intervention that can be given to all body systems
   ii. Correlate findings to common pediatric pathologies related to the systems development from embryologic development through maturation
   iii. Developing a Differential Diagnosis list and identify findings outside the personal scope of the individual pediatric clinical specialists' knowledge, experience, or expertise

c. Select appropriate outcome measures based on examination: Selecting and prioritizing tests and measures based on history, systems review, scientific merit, clinical utility, and physiologic or fiscal cost to patient or client relative to criticality of data.
   i. Review currently used normed, and criterion referenced testing tools and the administration, application, methods, reliability, validity, and standardization of these tools.

d. Select appropriate test and measures: Range of motion and muscle length, including analysis of age-appropriate functional range of motion, muscle, joint, and soft tissue characteristics using goniometers, tape measures, rulers, and inclinometers, etc.

13. Complete a through and timely pediatric evaluation: determine diagnosis, prognosis, and appropriate plan of care based on patient presentation and examination
    a. Using pattern recognition to interpret body structure and function impairments within the functional movement system, and the impact on activity and participation
    b. Using the ICF model in clinical practice: Linking impairments, activity limitations and participation restrictions, and psychosocial factors to the promotion of age and setting appropriate health and wellness along with the expressed goals of the patient or client/family/caregiver.
    c. Demonstrates prognostication by:
       i. Utilizing evidence-based resources, including (but not limited to) clinical practice guidelines, to predict improvement and optimal level of function.
       ii. Predicting amount of time to achieve optimal level of improvement in function.
       iii. Developing a plan of care within the appropriate service delivery model that prioritizes interventions based on ICF model
14. Analyze components to discharge planning in the pediatric population
15. Application of appropriate selection of test and measures: pediatric outcome measures
    a. Determine need for normative vs. criterion-based outcome measures
    b. Synthesize value of different types of pediatric outcome measures based on psychometric properties

   c. Create a thorough evaluation of a child selecting most appropriate outcomes measures to assess impairments across the ICF
16. Recognize common movement system diagnoses and the role is plays on participation restrictions for a child
17. Assess functional movements and determine hypotheses for body structure and function impairments
18. Complete a through and timely pediatric movement analysis: determine diagnosis, prognosis, and appropriate plan of care based on patient presentation and movement analysis
19. Using pattern recognition to interpret body structure and function impairments within the functional movement system, and the impact on activity and participation
20. Using the ICF model and movement system diagnoses in clinical practice: Linking impairments, activity limitations and participation restrictions, and psychosocial factors to the promotion of age and setting appropriate health and wellness along with the expressed goals of the patient or client/family/caregiver.
21. Discuss motor learning mechanisms to promote motor competence
22. Identify pediatric specific strategies to promote motor learning based on current research
23. Analyze to role of practice structure in promoting functional skill development
24. Apply pediatric specific strategies to promote motor learning based on current research

Required Reading:

- Campbell Textbook: https://www.amazon.com/Campbells-Physical-Therapy-Children-Palisano/dp/0323797962
- Neonatology Textbook: https://www.amazon.com/Neonatology-at-Glance-Tom-Lissauer/dp/1119513197/ref=sr_1_1?crid=1UL464UGINIMT&keywords=neonatology+at+a+glance&qid=1646320773&sprefix=neonatology+at+a+glanc%2Caps%2C96&sr=8-1
- Gannotti ME, Christy JB, Heathcock JC, Kolobe TH. A path model for evaluating dosing parameters for children with cerebral palsy. Phys Ther. 2014 Mar;94(3):411-21. doi: 10.2522/ptj.20130022. Epub 2013 Nov 14. PMID: 24231231; PMCID: PMC3967121.
- Gannotti ME. Coupling Timing of Interventions With Dose to Optimize Plasticity and Participation in Pediatric Neurologic Populations. Pediatr Phys Ther. 2017 Jul;29 Suppl 3(Suppl 3 IV STEP 2016 CONFERENCE PROCEEDINGS):S37-S47. doi: 10.1097/PEP.0000000000000383. PMID: 28654476; PMCID: PMC5488702.
- Richard K Shields, PT, PhD, FAPTA, Shauna Dudley-Javoroski, PT, PhD, Epigenetics and the International Classification of Functioning, Disability and Health Model: Bridging Nature, Nurture, and Patient-Centered Population Health, *Physical Therapy*, Volume 102, Issue 1, January 2022, pzab247, https://doi.org/10.1093/ptj/pzab247
- Begnoche, D. M., Chiarello, L. A., Palisano, R. J., Gracely, E. J., McCoy, S. W., & Orlin, M. N. (2016). Predictors of Independent Walking in Young Children With Cerebral Palsy. *Physical therapy*, *96*(2), 183–192. https://doi.org/10.2522/ptj.20140315
- Rosenbaum, P. L., Walter, S. D., Hanna, S. E., Palisano, R. J., Russell, D. J., Raina, P., Wood, E., Bartlett, D. J., & Galuppi, B. E. (2002). Prognosis for gross motor function in cerebral palsy: creation of motor development curves. *JAMA*, *288*(11), 1357–1363. https://doi.org/10.1001/jama.288.11.1357

- Lori Quinn, PT, EdD, FAPTA, Nora Riley, PT, PhD, NCS, Christine M Tyrell, PT, DPT, PhD, NCS, Dana L Judd, PT, DPT, PhD, Kathleen M Gill-Body, DPT, MS, NCS, FAPTA, Lois D Hedman, PT, DScPT, MS, Andrew Packel, PT, NCS, David A Brown, PT, PhD, FAPTA, Nikita Nabar, PT, DPT, MSPT, GCS, Patricia Scheets, PT, MHS, DPT, NCS, A Framework for Movement Analysis of Tasks: Recommendations From the Academy of Neurologic Physical Therapy's Movement System Task Force, *Physical Therapy*, Volume 101, Issue 9, September 2021, pzab154, https://doi.org/10.1093/ptj/pzab154

Residents will be notified as additional resources are assigned.

Recommended Reading:

To be sent out as assigned by instructors.

Resources:
http://www.psych.nyu.edu/adolph/index.php?page=home

http://schools.nyc.gov/NR/rdonlyres/DBD854CB-2553-4D5F-9DE9-E1351AF8D583/116878/TestsandMeasuresCheatSheet2.pdf

http://www.rehabmeasures.org/default.aspx

https://publications.aap.org/pediatrics/article-abstract/doi/10.1542/peds.2021-052138/184748/Evidence-Informed-Milestones-for-Developmental

Teaching Methods and Learning Experiences
Residents are exposed to current theory in motor development and motor control related to the pediatric population that forms the basis for the patient examination, evaluation, and plan of care development. This course provides a foundation for the concepts to be applied to cases in BPRP 860 and 865. The course will be a compliment of presentations, group problem solving and discussion, and application in the lab and clinical settings.

This material will be tested via quizzes, final written exam, as well as on all of the practical examinations. Integration of this information is expected to be demonstrated during the presentations performed by the resident as appropriate.

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Course Syllabus

Advanced Pediatric Practice Management

Course Description: This course builds upon the framework developed in the Pediatric Practice Foundations Series to refine examination, evaluation, and treatment planning utilizing a broader knowledge base to maximize the therapeutic benefit of the pediatric physical therapist. This series will focus on motor development and the relationship to common facilitation interventions for the pediatric physical therapist. This course promotes family centered care, promoting determined play, maintain patient relationships with behavior management and addressing pediatric pain. In addition, this course will cover the concept of play and how to engage therapeutic goals in a playful environment.

Course Faculty:
Caroline Scott PT, DPT, PCS
Jessie Kristof, PT, DPT, PCS
Marissa Slate, DP, DPT, PCS
Other guest speakers as assigned

Contact Hours:
Lecture (Synchronous and asynchronous) and Lab – 58 Hours

Outline of Content:

Session 1/9: Pediatric Intervention	4 CH
Session 2/9: Play in Therapeutic Intervention	4 CH
Session 3a,b/9: Infant Development and Handling	8 CH
Session 4/9: Behavior Management (see CEU above)	8 CH
Session 5a,b/9: Locomotor Development and Training	8 CH
Session 6/9: Orthotics, Prosthetics, DME and Assistive Technology	10 CH
Session 7/9: Pediatric Pain	4 CH
Session 8/9: Obesity, Wellness and Fitness	4 CH

Session 9/9:
Manual Therapy for the Pediatric Clinician 8 CH

Resident Objectives
At the completion of this course the resident will be able to:

1. Understand the definition of play and summarize ways that can be implemented in the therapeutic environment
2. Application of child-led play techniques to promote exercise dosing including the use of:
    a. Play-based Learning, Imaginary Play, "Exercise" Games and Obstacle Courses
    b. Promoting determined play, resilience, variability and adaptability
    c. F Words in therapeutic intervention
    d. UE and LE specific exercises to address ICF impairments
    e. Fundamental human movements
3. Analyze the value of various tools to promote motivation in therapy
4. Synthesize the helpful tips for creating play and promote therapeutic goals in therapy
5. Incorporate principles of play and play development for engaged treatment sessions
6. Utilize movement facilitation skills and TIMP items to promote infant development and gross motor milestones
    a. Review key points of control to promote movement facilitation
    b. Analyze therapeutic positions and handling to promote attaining and maintaining these positions
    c. Hands on practice with TIMP administration and scoring for outcome measure
    d. Practice identifying infants under the age of 4-5 months with delayed motor development or atypical motor performance (diagnosis)
    e. Develop intervention goals for infants with delayed motor development (planning interventions)
    f. Analysis of how well an infant's primary repertoire matches that of a developmentally well-organized infant of similar age
    g. Interpretation of normative data; calculation of Z-scores, age equivalents and percent delay
    h. Discussion of team utilization of this outcome measure in clinical practice
7. Utilize behavior management strategies to handle the developing pediatric client
    a. Describe the ABCs of behavior and use this to shape or modify behaviors to maximize participation and value of therapy
    b. Identify the relationship between ABA and ICF models
    c. Recognize when professional referral is indicated for behavioral issues beyond scope of practice
8. Application of locomotor training principles to overground and treadmill training with appropriate pediatric patients
    a. Gail, locomotion, and balance including analysis of arthrokinematics, biomechanical, kinematic, and kinetic characteristics of gait, locomotion, and balance on various terrains and in different physical environments using data from visual assessment, safety assessments, wheelchair and mobility assessment, linear

measures, goniometric measures, EMG video, weight bearing scales, footplates, etc.
   b. Discuss the role of the principle of neuroplasticity with respect to locomotor training
   c. Explore pediatric considerations with gait training and direct application to intervention approaches
   d. Synthesize clinical research for application and dosing of locomotor training in both adults and children
   e. Analyze the role of salience in locomotor training intervention for a pediatric patient
9. Write a prescription letter for adaptive technology or seating for a pediatric patient
   a. Discuss and recommend equipment options available and process to order
   b. Submit letter of medical necessity to ATP
   c. Assisting with obtaining funding for recommended equipment, including providing a rationale for selection and use.
10. Prescription, application and, as appropriate, fabrication of assistive, adaptive, supportive, and protective devices or equipment
   a. Assistive and adaptive devices including analysis of the potential to remediate impairment or activity and functional limitations through use of an assistive or adaptive device (e.g., appropriate device components, fit and alignment, safety during use)
11. Make appropriate clinical decision regarding orthotic selection for the pediatric population
   a. Orthotic, protective, and supportive devices including examination and analysis of a device and the potential to remediate activity or functional limitations, and energy conservation and expenditure while wearing a device (e.g., altered kinematics, ease of use, alignment and fit of device, skin condition in response to use, ability of patient or client/family/caregiver to understand, use, and don and doff device).
12. Incorporate basic approach to pain management in pediatric population as appropriate
   a. Discuss pediatric pain from a multidimensional framework
   b. Confidently evaluate chronic pain conditions including standardized assessment tools
   c. Implement appropriate interventions for chronic pediatric pain conditions.
13. Describe physical therapist's role in wellness and prevention for the pediatric patient
   a. Utilize principles of exercise physiology, biomechanics, and kinesiology to Define obesity and discuss contributing health risks or medical conditions associated with this diagnosis
   b. Assessment of a child's aerobic capacity and endurance, including examination of the patient's or client's pulmonary function, and response to tests of aerobic capacity and endurance (e.g., signs of stress, respiratory distress, exertion, vital signs, auscultation, and breathing patterns).
   c. Assessment of anthropometric characteristics, including examination of age- and gender- appropriate anthropometric characteristics over time (e.g., posture, edema, effusion, height and weight, length and girth, leg length, palpation).
   d. Implementation and dosing of aerobic endurance activities

   e. Analyze outcome measures to be used for ICF assessment in this population
   f. Evaluate PT's role in obesity management, lifestyle changes and physical literacy
14. Identify appropriate adjunct services and devices to support pediatric patient needs beyond the scope of physical therapy
   a. Pelvic health needs of pediatric patients including bladder/bowel management
   b. Sport specific interventions and post-surgical management of pediatric patient
15. Properly assess joint integrity and mobility in the pediatric client, including examination of the joint for integrity, movement quality and injury (e.g., joint hypermobility or hypomobility, kinematics during activity, swelling, inflammation, restriction, and sprains).
16. Perform age-appropriate manual therapy techniques as appropriate for common pediatric orthopedic impairment presentations including, connective tissue massage, joint mobilization, and soft tissue mobilization.

Required Reading

- Campbell Textbook: https://www.amazon.com/Campbells-Physical-Therapy-Children-Palisano/dp/0323797962
- Cuda, S. E., & Censani, M. (2019). Pediatric Obesity Algorithm: A Practical Approach to Obesity Diagnosis and Management. *Frontiers in pediatrics*, *6*, 431. https://doi.org/10.3389/fped.2018.00431
- van Mil, E., & Struik, A. (2017). Overweight and Obesity in Children: More Than Just the Kilos. *Pediatric physical therapy : the official publication of the Section on Pediatrics of the American Physical Therapy Association*, *29 Suppl 3*, S73–S75. https://doi.org/10.1097/PEP.0000000000000384
- Paleg, G. S., Smith, B. A., & Glickman, L. B. (2013). Systematic review and evidence-based clinical recommendations for dosing of pediatric supported standing programs. *Pediatric physical therapy : the official publication of the Section on Pediatrics of the American Physical Therapy Association*, *25*(3), 232–247. https://doi.org/10.1097/PEP.0b013e318299d5e7

To be assigned by instructors as appropriate

Teaching Methods and Learning Experiences

Residents are exposed to a broad collection of the literature related to the principles of adult learning and teaching-learning interactions. Development of actual teaching-learning processes forms the basis of the learning process and provides examples for the students to apply the course concepts. Residents use interactive methods, presentations, group problem solving and discussion as methods of inquiry.

This material will be tested on the final written exam as well as on all of the practical examinations. Integration of this information is expected to be demonstrated during the presentations performed by the Residents (as appropriate).

BROOKS Rehabilitation
INSTITUTE OF HIGHER LEARNING | Pediatric Residency Program

Course Syllabus

Specialty Management of the Pediatric Patient

Course Description: This course will cover care settings, education, adjunct therapy, roles, advocacy, transitional care needs, and personal factors. This course series will further investigate psychological and behavioral influences on care management. In addition, this course covers content unique to the pediatric setting and specific to medical management of common pediatric disorders as well as aides in identifying opportunities for referral and collaboration with other disciplines and specialties for neurologic patient management.

This course covers content unique to the pediatric setting that may or may not have been well-integrated into the diagnoses case series. In this course, residents will gain a better understanding of the adjunct services the pediatric population may need to access. In addition, we will cover current topics and trends in pediatric rehabilitation.

Course Faculty:
Caroline Scott PT, DPT, PCS
Jessie Kristof, PT, DPT, PCS
Marissa Slate, DP, DPT, PCS
Guest speakers as assigned

Contact Hours:
Lecture (Synchronous and Asynchronous) 36 Hours

Outline of Content:

Session 1/11:
Aquatic Therapy 4 CH

Session 2/11:
Pediatric Practice Models of Care 4 CH

Session 3/11:
Settings: NICU 4 CH

Session 4/11:
Settings: Educational Model of Care 4 CH

Session 5/11:
Settings: Medical Model of Care 4 CH

Session 6/11:
Settings: Private Practice 4 CH

Session 7/11:

The Educator in the Therapist 2 CH

Session 8/11:
Transitional Care to Adulthood 2 CH

Session 9/11:
Community Integration 2 CH

Session 10/11:
Advocacy, Leadership and Legal Issues 2 CH

Session 11/11:
Alternative Medicine and Therapies 2 CH

Resident Objectives
At the completion of this course the resident will be able to:

1. Discuss and support the role of physical therapy in the aquatics environment
    a. Discuss how aquatic therapy can be a tool when treating the pediatric population
    b. Review the properties of water and the pros and cons of working in the aquatic environment
    c. Understand the contraindications and precautions to taking a child in the pool
    d. Review the literature regarding aquatic therapy and discuss clinical implications of the aquatic environment in a therapeutic plan of care
2. Utilize appropriate delivery models of PT care
    a. Apply intervention dosing principles, including frequency, intensity, time and duration to maximize therapeutic value to match family goals
    b. Promote and initiate community and work (job/school/play) integration or reintegration to maximize outcomes in therapy
    c. Identify environmental, home, and work (job/school/play) barriers
    d. Promote developmentally appropriate self-care and home-management skills for independence of patients
    e. Determining need for admission to or discontinuation from a program, facility, or home professional
    f. Provide PT consultation (in person or via telehealth) by contributing special knowledge or expert opinion in client-based, community, or educational settings
3. Discuss and support the role of physical therapy across all care settings
    a. Review the importance of behavior sciences within each setting, including communication, social and psychological factors, pain science, developmental psychology, family-systems theory, ethics and values.
    b. Review common population health, epidemiology, laws and the role of health and wellness.
4. Discuss and support the role of physical therapy across educational care setting

   a. Review the importance of behavior sciences within each setting, including communication, social and psychological factors, pain science, developmental psychology, family-systems theory, ethics and values.
   b. Review common population health, epidemiology, laws and the role of health and wellness
5. Discuss the role of PT in the educational model
   a. Select and apply appropriate outcome tools based on school or EI settings and goals
   b. Promoting family centered care through the coaching model
   c. Identify support systems for staff and families across educational settings to assist with care
6. Understand laws and regulations related to ADA, IDEA, FAPE and additional relevant laws for pediatric therapeutic care
7. The physical therapist practicing as a pediatric clinical specialist demonstrates consultation (in person or via telehealth) by contributing special knowledge or expert opinion in client-based, community, or educational settings by:
   a. Providing an internal or second opinion of developmental, functional, or disability status.
   b. Determining need for admission to or discontinuation from a program, facility, or home professional service for the patient or client and, as applicable, family.
   c. Analyzing risk and contextual factors, to identify and make appropriate referrals (e.g., disease, trauma, abuse, neglect).
   d. Population screening and surveillance for risk factors and potential for activity limitations and participation restrictions.
8. Application of the coaching model into a treatment session
9. Select and apply appropriate outcome tools based on settings and goals
10. Identify support systems for staff and families across settings to assist with care
11. Identify and understand medical and surgical considerations across pediatric settings
   a. Management of lines and leads to promote early mobilization
   b. Distinguish between value in different Imaging studies
   c. Appreciate the impact of pharmacology (e.g., opioid addiction, polypharmacy, on/off label use of prescription, nonprescription medications)
   d. Recognize and understand relevant ancillary tests (e.g., lab studies, EKG, electrophysiological exams)
   e. Regenerative medicine (e.g., genetic markers, stem cell application, genetic-based alterations to pharmacological interventions, immunity).
   f. Utilize basic infection prevention strategies
12. Understand that the NICU is a subspecialty setting of Pediatrics with its own clinical APTA competencies.
13. Describe the role of the Physical Therapist in the NICU.
14. Describe and explain why developmental care is important in the NICU.
   a. Education to a parent on difference in sensorimotor development for a child born premature
   b. Explain how the family and infant play an important role in developmental care
   c. Education on the importance of weight gain, feeding, homeostasis and vital stability in discharge planning

15. Complete a NICU examination and evaluation utilizing cluster care
    a. Examination of motor function (motor control and learning) in a neonate including examination and analysis of neurological, neuromotor, neurobehavioral, and movement scales (e.g., neonatal scales, movement of the head, trunk, and limbs, dexterity, agility, coordination, equilibrium, and righting reactions).
    b. Utilize NICU setting outcome measures to assess progress over time
16. Promote the developmental progression of a child through positioning and nesting
17. Describe incidence, prevalence, and risk factors for neurodevelopmental disabilities in the pediatric population
18. Discuss the importance of transitional care in the pediatric population
19. Identify the role of the PT in managing support personal for clinical and community programs to promote wellness in the developmental disability population
    a. Self-care and home-management, including analysis of mobility with self-care and home management activities, and physiologic responses to environment and school or job tasks as observed or reported by the patient or client/family/caregiver and other professionals.
    b. Identify the role of diversity, inclusion and equality in promoting participation of children with different abilities
20. Design an individualized treatment plan for wellness in a child transitioning into adulthood including selection of relevant tests and measures
    a. Functional training (self-care, school, community):
    b. Basic ADL training in mobility (bed and bathroom mobility, transfer).
    c. Basic ADL training in self-care (eating, grooming, dressing).
    d. Training of family/caregivers in supporting neonatal and infant basic ADL activities (e.g., positioning and feeding).
    e. Environmental adaptations.
    f. Instrumental ADL training (e.g., shopping, driving, playground or peer activities, home).
21. Advocate for patients and the physical therapy profession at the clinic, local, state and federal level.
    a. **Leadership**
        i. Modeling efficient clinical reasoning and advanced pattern recognition selectivity in patient and client examination, evaluation, and intervention.
        ii. Seeking opportunities to mentor and be mentored by others to expand personal knowledge, skills, and abilities.
        iii. Searching for and participating in activities beyond immediate scope of responsibility to expand, improve, or define the practice or awareness of pediatric physical therapy.
    b. **Administration** of services in a variety of delivery models by:
        i. Identifying overall functions, prioritizing administrative needs, and identifying necessary and available resources.
        ii. Developing and/or implementing and evaluating policies and procedures for the pediatric physical therapy service.
        iii. Effectively supervising and evaluating performance of professional and support staff.

iv. Collecting, analyzing, and interpreting clinical, productivity, and financial data for quality assurance, quality improvement, marketing, and public relations.

22. Advocate for patients and the physical therapy profession throughout the life span
23. Discuss and analyze various legal issues when working with the pediatric population
24. Identify patterns of behavior and physical signs that may indicate neglect.
25. Discuss the legal and ethical obligation to report suspected child abuse.
26. Identify alternate treatment options often presented by parents or community
27. Review principles of evidence in selecting an evidence-based response
28. Synthesize the material for a professional response to family concerns
29. Identify contemporary trends and treatment ideas related to pediatric patient population
30. Describe appropriate pediatric use for modalities such as aquatic therapy, technology and electrotherapeutic modalities (e.g., microcurrent, biofeedback, FES, and NMES).

Required Reading:

- Campbell Textbook: https://www.amazon.com/Campbells-Physical-Therapy-Children-Palisano/dp/0323797962
- Neonatology Textbook: https://www.amazon.com/Neonatology-at-Glance-Tom-Lissauer/dp/1119513197/ref=sr_1_1?crid=1UL464UGINIMT&keywords=neonatology+at+a+glance&qid=1646320773&sprefix=neonatology+at+a+glanc%2Caps%2C96&sr=8-1
- Communication Book: https://www.amazon.com/How-Talk-Kids-Will-Listen/dp/1451663889/ref=sr_1_1?crid=YW8KWOQ3GPJJ&keywords=how+to+talk+to+kids+so+they+will+listen&qid=1646320982&sprefix=how+to+talk+to+%2Caps%2C103&sr=8-1
- Hanson, H., Harrington, A. T., & Nixon-Cave, K. (2015). Implementing treatment frequency and duration guidelines in a hospital-based pediatric outpatient setting: administrative case report. *Physical therapy*, *95*(4), 678–684. https://doi.org/10.2522/ptj.20130360
- Bailes, A. F., Reder, R., & Burch, C. (2008). Development of guidelines for determining frequency of therapy services in a pediatric medical setting. *Pediatric physical therapy : the official publication of the Section on Pediatrics of the American Physical Therapy Association*, *20*(2), 194–198. https://doi.org/10.1097/PEP.0b013e3181728a7b
- Orlin, M. N., Cicirello, N. A., O'Donnell, A. E., & Doty, A. K. (2014). The continuum of care for individuals with lifelong disabilities: role of the physical therapist. *Physical therapy*, *94*(7), 1043–1053. https://doi.org/10.2522/ptj.20130168

Residents will be notified as additional resources are assigned.

Recommended Reading:
Providing Physical Therapy Services Under Parts B&C of the Individuals with Disabilities Education Act (IDEA). Irene R McEwen, PT, PhD, FAPTA, Editor

Resources:

http://lpfch-cshcn.org/publications/research-reports/developing-structure-and-process-standards-for-systems-of-care-serving-children-and-youth-with-special-health-care-needs/

http://www.parentcenterhub.org/resources/

Teaching Methods and Learning Experiences

Residents are exposed to a variety of literature, experiences, and resources to enhance their understanding of pediatric therapy settings. This course will develop application of material covered in Pediatric Practice Foundations. The course will be a compliment of exposure, presentations, group problem solving and discussion, and application in the lab and clinical settings.

This material will be tested via quizzes, final written exam, as well as on all of the practical examinations. Integration of this information is expected to be demonstrated during the presentations performed by the resident as appropriate.

BROOKS Rehabilitation
INSTITUTE OF HIGHER LEARNING | Pediatric Residency Program

Course Syllabus

Diagnosis Series – System Conditions

Course Description: This course is an advanced study of pediatric physical therapy presented in a case-based format. Each case provides valuable information to the Resident regarding the Foundational Sciences including neuroscience, neuroanatomy, neurophysiology, and movement science as well as the anatomy, physiology and kinesiology of selected conditions common to the pediatric population. The Clinical Sciences including pharmacology, pathokinesiology, and exercise physiology are integrated into the physical therapy management of the pediatric client with musculoskeletal, neuromuscular, cardiovascular, cardiopulmonary, integumentary and cognitive impairments. The comprehensive assessment of a pediatric patient is also emphasized. Concepts relayed in each case are to be integrated and applied in subsequent cases.

An integrated framework for decision making in the physical therapy screening, examination, evaluation, differential diagnosis and prognosis of the pediatric client provides a sound basis for intervention development. Each case is designed to capture the complexity of the pediatric client while reflecting common medical issues present in this population. The resident will learn to consider growth and development related to the pediatric client management. The resident will also learn how to organize the management of the pediatric client such that collaboration and referral to the appropriate health care professional meets the goals of optimizing function and maintaining independence for the pediatric client.

Course Faculty:
Caroline Scott PT, DPT, PCS
Jessie Kristof, PT, DPT, PCS
Marissa Slate, DP, DPT, PCS
Guest speakers as assigned

Contact Hours:
Lecture (Synchronous and asynchronous) and Lab - 88 Hours

Resident Objectives
At the end of this **course**, residents will be able to:

1. Demonstrate the ability to successfully implement an appropriate communication level and style with pediatric patients and their caregivers.
2. Demonstrate the ability to identify signs and symptoms in the pediatric patient from the medical record review, interaction with the patient and family and/or caregivers, as well as the history and systems review process, that warrant referral to alternative healthcare providers.
3. Demonstrate the ability to perform a comprehensive physical therapy examination of a pediatric patient using ICF model concepts and the most current version of the APTA's *Guide to Physical Therapist Practice.*

4. Demonstrate the ability to integrate information from the physical therapy examination while using ICF model concepts and principles of evidence-based practice to develop the appropriate physical therapy diagnosis and prognosis
5. Demonstrate the ability to prescribe the appropriate intervention and/or home exercise program using principles of evidence-based practice
6. Demonstrate the ability to develop the appropriate plan of care including goal development based on the diagnosis and prognosis using principles of evidence-based practice
7. Demonstrate the ability to develop the appropriate discharge plan starting on the day of the initial examination using evidence-based principles
8. Demonstrate the ability to select and implement the appropriate interventions based on examination findings, ICF model concepts, principles of evidence-based practice, available resources, and patient preference
9. Recognize the need to modify interventions as well as demonstrate the ability to perform an appropriate re-assessment/re-examination based on child's response to prescribed interventions

Resources:
To be assigned and added prior to cases

Outline of Content:

Asynchronous System Development Review 5 CH

- Discuss normal system development from in utero through maturation
  - Anatomy, histology, including embryonic development and aging of individuals with lifelong disabilities of the following systems:
    - Musculoskeletal system.
    - Neuromuscular system.
    - Cardiovascular/pulmonary system.
    - Integumentary system.
    - Other systems.
  - Present normal and abnormal findings
  - Correlate findings to common pediatric pathologies related to the systems
  - Review secondary conditions with system implications
- Apply the value of a systematic review for the role of PT in common pathologies and prevention of secondary complications

MSK System Conditions

Case #1: Torticollis 8 CH
Session 1/8

Readings: To be assigned

- Kaplan S, Coulter C, Sargent B. Physical Therapy Management of Congenital Muscular Torticollis: A 2018 Evidence-Based Clinical Practice Guideline From the APTA Academy of Pediatric Physical Therapy. *Pediatr Phys Ther*. 2018;30(4):240-290 .

Resident Objectives: At the completion of this **case**, resident will:

1. Appraise literature guidelines for torticollis management
2. Arrange a concise pediatric examination inclusive of appropriate tests and measures for a child with a diagnosis of torticollis.
3. Differentiate abnormal findings and differential diagnosis from clinical examination
4. Formulate new proposed medical diagnosis, prognosis, and plan of care based on examination findings
5. Apply appropriate treatment techniques including:
    a. Therapeutic exercise
    b. Functional training
    c. Adaptive and assistive technology
    d. Family training and education
6. Compare developmental and secondary common orthopedic disorders in the child with neuromuscular congenital disorder presentation
7. Correctly diagnose torticollis classification and craniofacial abnormalities

Case #2: Orthopedic Developmental Conditions 4 CH
Session 2/8

Readings: To be assigned

- APTA Consortium Content

Resident Objectives: At the completion of this **case**, resident will:

1. Review the influence of skeletal development on motor function
    a. Explain MSK anatomy and histology, including embryonic development and aging of individuals with lifelong disabilities of the Musculoskeletal system.
    b. Demonstrate understanding of normal lower extremity musculoskeletal development from infancy through childhood and the changes over time
2. Demonstrate understanding of the etiology, incidence, signs and symptoms of common lower extremity pediatric musculoskeletal conditions.
    a. Describe management strategies for common pediatric MSK clinical scenarios
3. Assessment of muscle performance including analysis of muscle tone, strength, power, and endurance through manual muscle testing, and dynamometry, with modification based on muscle performance, pain and soreness.
    a. Describe the effect that developmental conditions may have on the development of alignment, strength, and functional movement.
    b. integrate evidence based tests and measures and interventions into the treatment planning for common lower extremity musculoskeletal developmental conditions
4. Analyze assistive and adaptive devices including analysis of the potential to remediate impairment or activity and functional limitations through use of an assistive or adaptive device (e.g., appropriate device components, fit and alignment, safety during use).
5. Review compensatory interventions to address MSK deficiencies

a. Orthotic, protective, and supportive devices including examination and analysis of a device and the potential to remediate activity or functional limitations, and energy conservation and expenditure while wearing a device.
b. Prosthetics, including analysis, identification, and modification of appropriate components, fit, and benefits of a prosthetic device to the patient or client, and the prosthesis' potential ability to remediate activity or participation limitations.

Case #3: Spinal Conditions 2 CH
Session 3/8
Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Review the influence of spinal development on motor function
    a. Explain spinal anatomy and histology, including embryonic development and aging of individuals with lifelong disabilities of the Musculoskeletal system.
2. Understanding of the etiology, incidence, signs and symptoms of pediatric spinal conditions.
    a. Describe management strategies for neuromuscular vs. idiopathic scoliosis
    b. Review various comprehensive schools of thought for approach to scoliosis management
3. Perform various tests and measures commonly used as part of a MSK assessment
    a. Muscle performance including analysis of muscle tone, strength, power, and endurance through manual muscle testing, and dynamometry, with modification based on muscle performance, pain and soreness.
    b. Posture, including analysis of static and dynamic posture in any positions or movements with posture grids, plum lines, lower extremity alignment, spinal alignment, and videotape and visual assessment, etc.
    c. Range of motion and muscle length, including analysis of age-appropriate functional range of motion, muscle, joint, and soft tissue characteristics using goniometers, tape measures, rulers, and inclinometers, etc.
4. Review compensatory interventions to address spinal alignment deficiencies
    a. Orthotic, protective, and supportive devices including examination and analysis of a device and the potential to remediate activity or functional limitations, and energy conservation and expenditure while wearing a device.

Case #4: Arthrogryposis (AMC) 2 CH
Session 4/8

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Review the influence of abnormal MSK development on motor function

   a. Explain abnormal MSK anatomy and histology, including embryonic development and aging of individuals with lifelong disabilities of the Musculoskeletal system.
   b. Identify signs and symptoms specific to diagnosis: types of AMC, etiology of diagnosis
2. Apply pediatric physical therapy evaluation skills to capture ICF and movement system impairments for pediatric patient with arthrogryposis
   a. Identify common body structure and function impairments secondary to common presentations of arthrogryposis
   b. Relate body structure and function impairments to potential activity limitations and participation restrictions
   c. Appropriate test and measures, including assessment of muscle performance including movement analysis
   d. Evaluate PT POC development across the lifespan
   e. Promoting activity and participation with a multidisciplinary approach
3. Develop appropriate treatment plan and interventions including:
   a. Therapeutic exercise
   b. Functional training
   c. Adaptive and assistive devices to support patient and family
4. Review compensatory interventions to address MSK deficiencies
   a. Orthotic, protective, and supportive devices including examination and analysis of a device and the potential to remediate activity or functional limitations, and energy conservation and expenditure while wearing a device.

Case #5: Osteogenesis Imperfecta (OI) 2 CH
Session 5/8

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Review the influence of abnormal MSK development on motor function
   a. Explain abnormal MSK anatomy and histology, including embryonic development and aging of individuals with lifelong disabilities of the Musculoskeletal system.
   b. Identify signs and symptoms specific to diagnosis: types of OI and influence on life expectancy
2. Apply pediatric physical therapy evaluation skills to capture ICF and movement system impairments for pediatric patient with OI
   a. Identify common body structure and function impairments secondary to common presentations of OI
   b. Relate body structure and function impairments to potential activity limitations and participation restrictions
   c. Appropriate test and measures, including assessment of muscle performance including movement analysis

   d. Evaluate PT POC development across the lifespan
   e. Promoting activity and participation with a multidisciplinary approach
3. Develop appropriate treatment plan and interventions including:
   a. Therapeutic exercise
   b. Functional training
   c. Adaptive and assistive devices to support patient and family
4. Review compensatory interventions to address MSK deficiencies
   a. Orthotic, protective, and supportive devices including examination and analysis of a device and the potential to remediate activity or functional limitations, and energy conservation and expenditure while wearing a device.

Case #6: Neuromuscular Disease: Dystrophies and SMA 3 CH
Session 6/8

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:
1. Identify signs and symptoms of neuromuscular diseases including DMD, SMA and congenital myopathies
   a. Application of Foundational Sciences specific to genetics/genomics/epigenetics
   b. Examination of phenotypic characteristics of genetic diagnoses
2. Examine trends in development of children with genetic disabilities across the lifespan including risks and opportunities for therapeutic intervention
3. Review the influence of abnormal MSK development on motor function
   a. Explain abnormal MSK anatomy and histology, including embryonic development and aging of individuals with lifelong disabilities of the Musculoskeletal system.
   b. Identify signs and symptoms specific to diagnosis: types of neuromuscular diseases and influence on life expectancy
4. Apply pediatric physical therapy evaluation skills to capture ICF and movement system impairments for pediatric patient with neuromuscular disease
   a. Identify common body structure and function impairments secondary to common presentations of neuromuscular diseases
   b. Relate body structure and function impairments to potential activity limitations and participation restrictions
   c. Appropriate test and measures, including assessment of muscle performance including movement analysis
   d. Evaluate PT POC development across the lifespan
   e. Promoting activity and participation with a multidisciplinary approach
5. Develop appropriate treatment plan and compensatory interventions including:
   a. Therapeutic exercise
   b. Functional training
   c. Adaptive and assistive devices to support patient and family

6. Orthotic, protective, and supportive devices including examination and analysis of a device and the potential to remediate activity or functional limitations, and energy conservation and expenditure while wearing a device.
7. Analyze the research related to evidence-based interventions for specific genetic diagnoses
    a. Early mobility training in complex medical case (e.g., ECME, PICU).
    b. Gait, locomotion or elevation training with or without assistive devices or equipment including robotic devices.
    c. Motor function (motor control and motor learning) training and retraining.
    d. Neuromuscular education and reeducation.
    e. Neuromuscular relaxation, inhibition, and facilitation.
    f. Perceptual training (e.g., sensory motor training).
    g. Posture and body mechanics training (for patient or client/family/caregivers).
    h. Strengthening activities (active, assistive, resistive).
    i. Stretching.
    j. Structured play activities.
8. Identify the role of the PT in managing support personal for clinical and community programs to promote wellness in the developmental disability population
9. Discuss a plan for life-long management of a child with progressive genetic disability

Case #7: Limb Deficiencies and Amputations 2 CH
Session 7/8

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Review the influence of abnormal MSK development on motor function
    a. Explain abnormal MSK anatomy and histology, including embryonic development and aging of individuals with lifelong disabilities of the Musculoskeletal system.
    b. Identify signs and symptoms specific to diagnosis: classification systems, etiology and treatment options
2. Apply pediatric physical therapy evaluation skills to capture ICF and movement system impairments for pediatric patient with limb deficiencies and amputations
    a. Identify common body structure and function impairments secondary to common presentations of limb deficiencies and amputations
    b. Relate body structure and function impairments to potential activity limitations and participation restrictions
    c. Appropriate test and measures, including assessment of muscle performance including movement analysis
    d. Evaluate PT POC development across the lifespan
    e. Promoting activity and participation with a multidisciplinary approach
3. Develop appropriate treatment plan and compensatory interventions including:
    a. Therapeutic exercise

   b. Functional training
   c. Adaptive and assistive devices to support patient and family
4. Present in 5x5 formatting on medical interventions and PT treatment implications
5. Review compensatory interventions to address limb deficiencies and amputations
   a. Orthotic, protective, and supportive devices including examination and analysis of a device and the potential to remediate activity or functional limitations, and energy conservation and expenditure while wearing a device.
   b. Prosthetics, including analysis, identification, and modification of appropriate components, fit, and benefits of a prosthetic device to the patient or client, and the prosthesis' potential ability to remediate activity or participation limitations.

Prosthetics, including analysis, identification, and modification of appropriate components, fit, and benefits of a prosthetic device to the patient or client, and the prosthesis' potential ability to remediate activity or participation limitations.

Case #8: Pediatric Orthopedic and Sports-Related Injuries 4 CH
Session 8/8

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:
1. Identify common pediatric UE and LE orthopedic and sports disorders
   a. Discuss pediatric athletic injury incidence, prevalence, and trends
2. Review principles of strength, power and aerobic exercise prescription and apply them to the pediatric athlete
3. Identify signs and symptoms of common pathologies and musculoskeletal injury and pain in the pediatric athlete across development (e.g., Osgood Schlatter, overuse injuries, joint injuries, growth plate injuries, limb injuries)
4. Demonstrate comprehensive examination of the pediatric athlete with consideration of motor development and activity demands of sport
   a. Select and implement appropriate tests and measures for the pediatric athlete
5. Develop plan for treatment including return to play for the pediatric athlete. Include the following:
   a. Therapeutic exercise
   b. Manual therapy
   c. Functional training
   d. Patient and family education
6. Discuss appropriate compensatory and protective techniques for return to play and prevention of reinjury

<u>Nervous System Conditions</u>

Case #1: Autism Spectrum Disorder (ASD) 4 CH
Session 1/6

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Describe incidence, prevalence, and risk factors for neurodevelopmental disabilities in the pediatric population
    - Review of ASD diagnosis process for DSM-5, levels of severity and relationship to genetic diagnoses
2. Identify common management for secondary impairments of neurodevelopmental disabilities including pharmacology and MD referral
3. Apply pediatric physical therapy evaluation skills to capture ICF and movement system impairments for pediatric patient with ASD
    - Identify common body structure and function impairments secondary to common presentations of ASD
    - Relate body structure and function impairments to potential activity limitations and participation restrictions
    - Appropriate test and measures, including assessment of muscle performance including movement analysis
    - Evaluate PT POC development across the lifespan
    - Promoting activity and participation with a multidisciplinary approach
4. Promoting activity and participation with a multidisciplinary approach
    - Demonstrate positional and transitional facilitation techniques into therapy practice
    - Promote self-care and home-management, including analysis of mobility with self-care and home management activities, and physiologic responses to environment and school or job tasks as observed or reported by the patient or client/family/caregiver and other professionals.

Case #2: Myelodysplasia & Hydrocephalus 2 CH
Session 2/6

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Utilize foundational neuroscience principles to examine neurological function, neurological pathology and apply pharmacology for intervention
2. Complete a neurologic screening including:
    a. Cranial nerve integrity including examination of cranial nerves through dermatomes and muscular innervations, function, and reflects (e.g., bite, sucking, swallow, cough, and gag reflexes, response to auditory, gustatory, olfactory, vestibular, and visual stimuli, coordination of suck/swallow and function).
    b. Integumentary protection including examination and assessment of activities, positions and postures, and adaptive devices that aggravate or relieve pain and/or

cause tissue trauma (e.g., continuity of skin color, sensation, skin temperature, tissue mobility, turgor, and texture).
   c. Sensory integrity (including proprioception and kinesthesia), including examination of combined (cortical) sensations, deep (proprioceptive) sensations, gross receptive sensations, and modification to sensory examination (e.g., stereognosis, tactile localization, vibration, vision, and hearing).
   d. Motor function (motor control and learning) including examination and analysis of neurological, neuromotor, neurobehavioral, and movement scales (e.g., neonatal scales, movement of the head, trunk, and limbs, dexterity, agility, coordination, equilibrium, and righting reactions).
3. Identify common body structure and function impairments secondary to common presentations of myelodysplasia
4. Relate body structure and function impairments to potential activity limitations and participation restrictions in patients with myelodysplasia
5. Identify signs and symptoms of common complications associated with myelodysplasia such as VP shunt malfunction and tethered cord
6. Application of therapeutic exercise to the neurologic patient: application, monitoring, and adaptation based on the patient's or client's response(s) to therapeutic exercise including but not limited to:
   a. Conditioning and reconditioning activities.
   b. Developmental activities.
   c. Motor learning, motor control and motor development

Case #3: Brachial Plexus Injuries 2 CH
Session 3/6

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Utilize foundational neuroscience principles to examine neurological function, neurological pathology and apply pharmacology for intervention
2. Complete a neurologic screening including:
   a. Cranial nerve integrity including examination of cranial nerves through dermatomes and muscular innervations, function, and reflects (e.g., bite, sucking, swallow, cough, and gag reflexes, response to auditory, gustatory, olfactory, vestibular, and visual stimuli, coordination of suck/swallow and function).
   b. Integumentary protection including examination and assessment of activities, positions and postures, and adaptive devices that aggravate or relieve pain and/or cause tissue trauma (e.g., continuity of skin color, sensation, skin temperature, tissue mobility, turgor, and texture).
   c. Sensory integrity (including proprioception and kinesthesia), including examination of combined (cortical) sensations, deep (proprioceptive) sensations, gross receptive sensations, and modification to sensory examination (e.g., stereognosis, tactile localization, vibration, vision, and hearing).

   d. Motor function (motor control and learning) including examination and analysis of neurological, neuromotor, neurobehavioral, and movement scales (e.g., neonatal scales, movement of the head, trunk, and limbs, dexterity, agility, coordination, equilibrium, and righting reactions).
3. Identify common body structure and function impairments secondary to common presentations of brachial plexus injury
4. Relate body structure and function impairments to potential activity limitations and participation restrictions in patients with brachial plexus injury
5. Identify 2 appropriate physical therapy interventions for a child with brachial plexus injury to work towards a functional goal.
6. Application of therapeutic exercise to the neurologic patient: application, monitoring, and adaptation based on the patient's or client's response(s) to therapeutic exercise including but not limited to:
   a. Conditioning and reconditioning activities.
   b. Developmental activities.
   c. Motor learning, motor control and motor development

Case #4: Central brain disorders of childhood – CVA/TBI and Cerebral Palsy 8 CH
Session 4/6

Readings: To be assigned

- Novak, et al. "State of the evidence traffic lights 2019: systematic review of interentions for preventing and treating children with cerebral palsy". *Current Neurology and Neuroscience Reports, 2020: 1910-1022.*

Resident Objectives: At the completion of this **case**, resident will:

1. Describe presentation of cerebral palsy and pediatric stroke
   a. Explain the relationship between developmental and acquired pediatric disorders related to ongoing development
   b. Educate a caregiver on the influence of prenatal, perinatal and postnatal factors in the development of cerebral palsy diagnosis
   c. Application of classification of CP in prognosis and PT plan of care development
   d. Justify the importance of early recognition in evaluation and treatment of a child with pediatric stroke or CP
2. Analyze pediatric gait in a child with CP related to the adult stroke survivor gait pattern.
   a. Assess gait utilizing appropriate outcome measures.
   b. Utilize gait analysis to determine orthotic, protective, and supportive devices including examination and analysis of a device and the potential to remediate activity or functional limitations, and energy conservation and expenditure while wearing a device
3. Clinically appraise outcome measures specific to the pediatric CP population.
4. Discuss the factors that affect impairment, function, and participation in a post-NICU survival of a child with pediatric stroke utilizing the ICF model
   a. Arousal, attention, and cognition, including examination and analysis of arousal, attention, cognition, behavioral state organization and stability, and behavioral

responses (e.g., level of consciousness, memory recall, intrinsic and extrinsic motivating factors, orientation to time, person, and place, expressive and receptive abilities).

b. Motor function (motor control and learning) including examination and analysis of neurological, neuromotor, neurobehavioral, and movement scales (e.g., neonatal scales, movement of the head, trunk, and limbs, dexterity, agility, coordination, equilibrium, and righting reactions).

5. Discuss family centered care related to the IFSP development for a post-NICU child
6. Demonstrate ability to participate in team components of IFSP development
7. Compare and contrast the role of PT in a transdisciplinary team approach in early intervention to traditional therapy roles in outpatient clinic settings
8. Demonstrate appropriate professional communication for family and transdisciplinary team training
9. Application of movement analysis, intervention discussion, system interactions and plan of care development for a child with cerebral palsy

Case #5: DCD 2 CH
Session 5/6

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Describe incidence, prevalence, and risk factors for developmental coordination disorder in the pediatric population
    - Review of DCD diagnosis process for DSM-5, levels of severity and relationship to additional diagnoses
2. Identify common management for secondary impairments of DCD including pharmacology and MD referral
3. Apply pediatric physical therapy evaluation skills to capture ICF and movement system impairments for pediatric patient with DCD
    - Identify common body structure and function impairments secondary to common presentations of DCC
    - Relate body structure and function impairments to potential activity limitations and participation restrictions
    - Appropriate test and measures, including assessment of muscle performance including movement analysis
    - Evaluate PT POC development across the lifespan
    - Promoting activity and participation with a multidisciplinary approach
4. Promoting activity and participation with a multidisciplinary approach
    - Demonstrate positional and transitional facilitation techniques into therapy practice
    - Promote self-care and home-management, including analysis of mobility with self-care and home management activities, and physiologic responses to environment and school or job tasks as observed or reported by the patient or client/family/caregiver and other professionals.

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Case #6: Down's Syndrome
Session 6/6 4 CH

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Identify genetic disorders: Chromosomal disorders, singe-gene disorders – numerical abnormalities
    a. Application of Foundational Sciences specific to genetics/genomics/epigenetics
    b. Examination of phenotypic characteristics of genetic diagnoses
2. Examine trends in development of children with genetic disabilities across the lifespan including risks and opportunities for therapeutic intervention
3. Identify signs and symptoms of Down syndrome
    a. Application of Foundational Sciences specific to genetics/genomics/epigenetics
4. Examination of phenotypic characteristics of genetic diagnoses
5. Review the influence of abnormal chromosomal development on motor function
    a. Explain abnormal system anatomy and histology, including embryonic development and aging of individuals with lifelong disabilities of the neuromuscular system
    b. Review to influence of hypotonia and hypermobility on movement patterns across motor skill development
6. Apply pediatric physical therapy evaluation skills to capture ICF and movement system impairments for pediatric patient with down syndrome
    a. Identify common body structure and function impairments secondary to common presentations of Down Syndrome
    b. Relate body structure and function impairments to potential activity limitations and participation restrictions
    c. Appropriate test and measures, including assessment of muscle performance including movement analysis
    d. Evaluate PT POC development across the lifespan
    e. Promoting activity and participation with a multidisciplinary approach
    f. Utilize motor skill development curves for prognosis and education with families on readiness for critical window of skill achievement
7. Develop appropriate treatment plan and compensatory interventions including:
    a. Therapeutic exercise
    b. Functional training
    c. Adaptive and assistive devices to support patient and family
    d. Considerations for treadmill training and other evidence-based interventions
8. Orthotic, protective, and supportive devices including examination and analysis of a device and the potential to remediate activity or functional limitations, and energy conservation and expenditure while wearing a device.
9. Analyze the research related to evidence-based interventions for specific genetic diagnoses

a. Early mobility training in complex medical case (e.g., ECME, PICU).
b. Gait, locomotion or elevation training with or without assistive devices or equipment including robotic devices.
c. Motor function (motor control and motor learning) training and retraining.
d. Neuromuscular education and reeducation.
e. Neuromuscular relaxation, inhibition, and facilitation.
f. Perceptual training (e.g., sensory motor training).
g. Posture and body mechanics training (for patient or client/family/caregivers).
h. Strengthening activities (active, assistive, resistive).
i. Stretching.
j. Structured play activities.

10. Identify the role of the PT in managing support personal for clinical and community programs to promote wellness in the developmental disability population

Cardiopulmonary System Conditions

Case #1: Congenital Heart Defects 2 CH
Session 1/3

Readings: To be assigned

- APTA Consortium Content

Resident Objectives: At the completion of this **case**, resident will:

1. Understand the relationship with CHD, birth defects and congenital disorders
    a. Review techniques for diagnosis and classification of congenital abnormalities
2. Review Cardiopulmonary development of the fetus and how that influences the presentation in infants
    a. Analyze the changes in fetal circulation after birth and influence of CHD on functional impairments
3. Discuss medical and therapeutic considerations for CHD and the influence on endurance and participation in the pediatric patient
4. Apply pediatric physical therapy evaluation skills to capture ICF and movement system impairments for pediatric patient with cardiopulmonary diagnoses
    a. Identify common body structure and function impairments secondary to common presentations of CHD or pulmonary diagnosis
    b. Relate body structure and function impairments to potential activity limitations and participation restrictions
    c. Appropriate test and measures, including assessment of muscle performance including movement analysis
    d. Evaluate PT POC development across the lifespan
    e. Promoting activity and participation with a multidisciplinary approach

Case #2: Pulmonary Conditions of Childhood 2 CH
Session 2/3

Readings: To be assigned

- APTA Consortium Content

Resident Objectives: At the completion of this **case**, resident will:

1. Review Cardiopulmonary development of the fetus and how that influences the presentation in infants
2. Discuss medical and therapeutic considerations for pulmonary diagnoses and the influence on endurance and participation in the pediatric patient
    a. Understand RSV and medical management vs. therapeutic management in acute care setting
    b. Analyze secondary implications of the cardiopulmonary system for neuromuscular diagnoses
3. Apply pediatric physical therapy evaluation skills to capture ICF and movement system impairments for pediatric patient with cardiopulmonary diagnoses
    a. Identify common body structure and function impairments secondary to common presentations of CHD or pulmonary diagnosis
    b. Relate body structure and function impairments to potential activity limitations and participation restrictions
    c. Appropriate test and measures, including assessment of muscle performance including movement analysis
    d. Evaluate PT POC development across the lifespan
    e. Promoting activity and participation with a multidisciplinary approach
    f. Utilize motor skill development curves for prognosis and education with families on readiness for critical window of skill achievement

Case #3: Cardiopulmonary Intervention 4 CH
Session 3/3

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Appropriately identify children with cardiovascular and pulmonary conditions affecting function
    a. Review cardiopulmonary conditions and therapeutic considerations
2. Analyze the research related to evidence-based interventions for CHD and primary/secondary cardiopulmonary diagnoses
    a. Early mobility training in complex medical case (e.g., ECME, PICU).
    b. Gait, locomotion or elevation training with or without assistive devices or equipment including robotic devices.
    c. Motor function (motor control and motor learning) training and retraining.
    d. Neuromuscular education and reeducation.
    e. Neuromuscular relaxation, inhibition, and facilitation.
    f. Posture and body mechanics training (for patient or client/family/caregivers).
    g. Strengthening activities (active, assistive, resistive).
    h. Stretching.
    i. Structured play activities.

3. Synthesize and practice techniques to perform a cardiopulmonary examination
4. Analyze and practice pulmonary interventions
    a. Demonstrate appropriate intervention techniques to assess chest mobility and respiration
    b. Actively participate in pulmonary lab for age-appropriate interventions to address pulmonary function as it relates to the whole child
    c. Ventilation, respiration, and circulation, including examination of ventilatory muscle strength, power and endurance, and cardio/pulmonary response at rest and during activity (e.g., chest wall mobility, expansion and excursion, capillary refill time, airway clearance, cough and sputum, and pulses).
    d. Techniques to maximize ventilation including, assistive cough techniques, mechanical devices, percussion, vibration, and postural drainage.
5. Review scar management and practice techniques to promote wound healing
6. Identify a child on their caseload requiring pulmonary function assessment and intervention.
    a. Appropriately apply material to identified case for follow up (to be completed in mentoring)

Other Systems Conditions

Case #1 Pediatric Burns 4 CH
Session 1/6

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

5. Discuss the pathology related to pediatric burn including impact across all systems
6. Perform examination on a child with acute or chronic burn injuries
7. Identify appropriate tests and measures to track progress in a childhood burn survivor
    - Integumentary integrity (for wounds) including examination of wound characteristics including activities, devices, positioning and postures that create or aggravate a wound or scar or that may produce additional tissue trauma (e.g., signs of infection, ecchymosis, burn, scar tissue characteristics).
    - Pain including analysis of pain and pain behaviors in reaction to services and tests and measures (e.g., provocation tests, phantom limb pain, pain perception using questionnaires, graphs, and visual analog scales).
8. Develop appropriate treatment plan and interventions including:
    a. Therapeutic exercise
    b. Functional training
    c. Adaptive and assistive devices to support patient and family
9. Identify appropriate treatment interventions and strategies for rehabilitation in the pediatric burn patient
    - Integumentary protection including examination and assessment of activities, positions and postures, and adaptive devices that aggravate or relieve pain and/or

cause tissue trauma (e.g., continuity of skin color, sensation, skin temperature, tissue mobility, turgor, and texture).

10. Discuss prognosis for development related to the management of pediatric burns
11. Review scar management and practice techniques to promote wound healing

Case #2: Rheumatic and Autoimmune Conditions of Childhood 3 CH
Sessions 2/6

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Discuss clinical presentation of various rheumatologic and autoimmune diseases of childhood
2. Describe common medical treatment and implications for therapy
3. Develop a treatment plan for a child with a rheumatologic diagnosis of childhood using an evidence-based approach
4. Describe appropriate ways to monitor treatment plans for the child with rheumatic or autoimmune disorders of childhood
    a. Utilize pain assessments including analysis of pain and pain behaviors in reaction to services and tests and measures (e.g., provocation tests, phantom limb pain, pain perception using questionnaires, graphs, and visual analog scales).

Case #3: Genetic Conditions: Chromosomal and Singe-gene disorders, Multifactorial and Mitochondrial Disorder
Session 3/4 4 CH

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Identify genetic disorders: chromosomal disorders, single-gene disorders, multifactorial disorders, mitochondrial disorders
    a. Application of Foundational Sciences specific to genetics/genomics/epigenetics
    b. Examination of phenotypic characteristics of genetic diagnoses
    c. Discuss congenital disorders and the relationship to other diagnoses
    d. Definition of mitochondrial disorders and relationship to plan of care development
2. Examine trends in development of children with genetic disabilities across the lifespan including risks and opportunities for therapeutic intervention
3. Identify phenotypic signs and symptoms of genetic and congenital disorders
    a. Application of Foundational Sciences specific to genetics/genomics/epigenetics
4. Examination of phenotypic characteristics of genetic diagnoses
5. Review the influence of abnormal chromosomal development on motor function

   a. Explain abnormal system anatomy and histology, including embryonic development and aging of individuals with lifelong disabilities of the neuromuscular system
   b. Review to influence of hypotonia and hypermobility on movement patterns across motor skill development
6. Apply pediatric physical therapy evaluation skills to capture ICF and movement system impairments for pediatric patient with down syndrome
   a. Identify common body structure and function impairments secondary to common presentations of Down Syndrome
   b. Relate body structure and function impairments to potential activity limitations and participation restrictions
   c. Appropriate test and measures, including assessment of muscle performance including movement analysis
   d. Evaluate PT POC development across the lifespan
   e. Promoting activity and participation with a multidisciplinary approach
   f. Utilize motor skill development curves for prognosis and education with families on readiness for critical window of skill achievement
7. Develop appropriate treatment plan and compensatory interventions including:
   a. Therapeutic exercise
   b. Functional training
   c. Adaptive and assistive devices to support patient and family
   d. Considerations for treadmill training and other evidence-based interventions
8. Orthotic, protective, and supportive devices including examination and analysis of a device and the potential to remediate activity or functional limitations, and energy conservation and expenditure while wearing a device.
9. Analyze the research related to evidence-based interventions for specific genetic diagnoses
   a. Early mobility training in complex medical case (e.g., ECME, PICU).
   b. Gait, locomotion or elevation training with or without assistive devices or equipment including robotic devices.
   c. Motor function (motor control and motor learning) training and retraining.
   d. Neuromuscular education and reeducation.
   e. Neuromuscular relaxation, inhibition, and facilitation.
   f. Perceptual training (e.g., sensory motor training).
   g. Posture and body mechanics training (for patient or client/family/caregivers).
   h. Strengthening activities (active, assistive, resistive).
   i. Stretching.
   j. Structured play activities.
10. Identify the role of the PT in managing support personal for clinical and community programs to promote wellness in the developmental disability population
11. Examine trends in development of children with congenital disabilities across the lifespan including risks and opportunities for therapeutic intervention
12. Identify the role of the PT in managing support personal for clinical and community programs to promote wellness in the developmental disability population
13. Discuss a plan for life-long management of a child with progressive congenital disability

Case #4: Pediatric Vestibular Function 6 CH
Session 4/6

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Recognize signs and symptoms vestibular pathology
    a. Review vestibular anatomy and development for application of its influences in function
    b. Review causes of pediatric vestibular dysfunction
2. Application of a pediatric vestibular examination: select and perform clinical vestibular testing
    a. Ocular motor exam
    b. Otolith Clinical Screening and Semicircular Canal testing
    c. Balance and Otolith function testing
3. Demonstrate appropriate treatment interventions for vestibular deficits including:
    a. Therapeutic exercise
    b. Functional training
    c. Use of assistive and adaptive equipment
4. Pediatric Vestibular Intervention: application, monitoring, and adaptation based on the patient's or client's response(s) to therapeutic exercise including but not limited to:
    a. Positioning
    b. Balance and motor coordination training

Case #5: Oncology and Childhood Cancer 4 CH
Session 5/6

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Discuss epidemiology of pediatric cancers: Malignant neoplastic disease and oncological disorders (cancers)
2. Identify pharmacology, pharmokinetics, and side effects of chemotherapy medications in the pediatric population
3. Review bone development in normal pediatric population compared to pathological development in pediatric patients undergoing chemotherapy treatment
4. Identify the components of the peripheral nervous system anatomy
5. Describe the pathology of peripheral neuropathy including signs, symptoms, and differential diagnosis
6. Complete appropriate assessment of pediatric oncology patient utilizing appropriate tests and measures

7. Develop treatment plan for pediatric oncology patient with bone demineralization and peripheral neuropathy including:
    a. Therapeutic exercise
    b. Functional training
    c. Assistive and adaptive technology including appropriate prescription
8. Describe ethical considerations in treatment of pediatric patients with terminal disorders
9. Identify trends in families with chronic medical conditions
10. Locate and develop resources for children and family support in chronic medical conditions

Case #6: Sensory Processing and Sensory Disabilities 4 CH
Session 6/6

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

- Discuss development of sensory systems relative to movement
    - Clinical Sciences: Sensory (e.g., vestibular, visual, somatosensory systems).
    - Identify basic sensory processing impairments that interfere with motor development and motor learning
    - Identify typical and atypical sensory processing
- Discuss diagnoses that are affected by sensory processing
    - Diagnoses with secondary sensory system involvement
    - Sensory modulation disorders, sensory-based motor disorders, sensory discrimination disorders
- Complete sensory screening and determine appropriate referrals outside the scope of PT
    - Neuromotor development and sensory integration/processing, including analysis and interpretation of age- and gender-appropriate development and sensory integration and processing (e.g., involuntary movement, gross and fine motor skills, reflex movement patterns, gait and posture, and oral-motor function).
    - Sensory integrity (including proprioception and kinesthesia), including examination of combined (cortical) sensations, deep (proprioceptive) sensations, gross receptive sensations, and modification to sensory examination (e.g., stereognosis, tactile localization, vibration, vision, and hearing).
- Apply sensory-based treatment strategies to pediatric cases
    - Specific application to children with poor registration, sensitivity to stimuli, sensory seeking and sensory avoiding behaviors
- Synthesize pediatric client examination skills and sensory testing to assess a child with vision and hearing impairments

Teaching Methods and Learning Experiences

This course will utilize a combination of traditional lectures with various audiovisual materials, group problem solving and discussion, and psychomotor labs. Handouts and learning activities to be accomplished outside of class time may accompany required readings for certain sessions.

Residents are exposed to current theory in motor development and motor control related to the pediatric population that forms the basis for the patient examination, evaluation, and plan of care development. This course provides a foundation for the concepts from prior class series to be applied to patient cases. The course will be a compliment of presentations, group problem solving and discussion, and application in the lab and clinical settings.

This material will be tested via quizzes as well as on all practical examinations and the final written exam. Integration of this information is expected to be demonstrated during the presentations performed by the resident as appropriate.

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Course Syllabus

Differential Diagnosis of the Pediatric Patient

Course Description: This course is an advanced study of pediatric physical therapy presented in a case-based format. Each case provides valuable information to the Resident regarding the Foundational Sciences including neuroscience, neuroanatomy, neurophysiology, and movement science as well as the anatomy, physiology and kinesiology of selected conditions common to the pediatric population. The Clinical Sciences including pharmacology, pathokinesiology, and exercise physiology are integrated into the physical therapy management of the pediatric client with musculoskeletal, neuromuscular, cardiovascular, cardiopulmonary, integumentary and cognitive impairments. The comprehensive assessment to promote differential diagnosis of a pediatric patient is emphasized for common therapeutic referrals. Concepts relayed in each case are to be integrated and applied in subsequent cases.

An integrated framework for decision making in the physical therapy screening, examination, evaluation, differential diagnosis and prognosis of the pediatric client provides a sound basis for intervention development. Each case is designed to capture the complexity of the pediatric client while reflecting common medical issues and the differential diagnosis process. The resident will learn to consider growth and development related to the pediatric client management. The resident will also learn how to organize the management of the pediatric client such that collaboration and referral to the appropriate health care professional meets the goals of optimizing function and maintaining independence for the pediatric client.

Course Faculty:
Caroline Scott PT, DPT, PCS
Jessie Kristof, PT, DPT, PCS
Marissa Slate, DP, DPT, PCS
Guest speakers as assigned

Contact Hours:
Lecture (Synchronous and asynchronous) and Lab - 16 Hours

Resident Objectives
At the end of this **course**, residents will be able to:

1. Demonstrate the ability to successfully implement an appropriate communication level and style with pediatric patients and their caregivers.
2. Demonstrate the ability to identify signs and symptoms in the pediatric patient from the medical record review, interaction with the patient and family and/or caregivers, as well as the history and systems review process, that warrant referral to alternative healthcare providers.
3. Demonstrate the ability to perform a comprehensive physical therapy examination of a pediatric patient using ICF model concepts and the most current version of the APTA's *Guide to Physical Therapist Practice.*

4. Demonstrate the ability to integrate information from the physical therapy examination while using ICF model concepts and principles of evidence based practice to develop the appropriate physical therapy diagnosis and prognosis
5. Demonstrate the ability to prescribe the appropriate intervention and/or home exercise program using principles of evidence based practice
6. Demonstrate the ability to develop the appropriate plan of care including goal development based on the diagnosis and prognosis using principles of evidence based practice
7. Demonstrate the ability to develop the appropriate discharge plan starting on the day of the initial examination using evidence based principles
8. Demonstrate the ability to select and implement the appropriate interventions based on examination findings, ICF model concepts, principles of evidence based practice, available resources, and patient preference
9. Recognize the need to modify interventions as well as demonstrate the ability to perform an appropriate re-assessment/re-examination based on child's response to prescribed interventions

Resources:
To be assigned and added prior to cases

Outline of Content:

Case #1: Hypotonia and EDS 2 CH
Session 1/7

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. The physical therapist will be able to decide whether to provide interventions for the individual or refer them to another provider or multiple providers for management, co-management, or consultation
2. Discuss hypotonia presentation and potential causes: epidemiology, presentation, and prognosis
    a. Assessment of tone in younger and older children
    b. Utilization of HINE hypotonia scale for standardized tone assessment
3. Recognize signs suggestive of need for medical referrals or genetic follow-up
    a. Differentiation of central vs. peripheral tone presentation
4. Evaluate factors related to hypotonia to aid in pattern recognition for differential diagnosis
    a. Synthesize examination skills for comprehensive PT POC for EDS
5. Utilize evaluation and follow up data to construct an appropriate prognosis and treatment plan for a differential diagnosis case involving motor delays
6. Application of movement system diagnoses to create PT interventions

Case #2: Developmental Delay and Prematurity 2 CH
Session 2/7

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. The physical therapist will be able to decide whether to provide interventions for the individual or refer them to another provider or multiple providers for management, co-management, or consultation
2. Discuss developmental delay presentation and potential causes: epidemiology, presentation, and prognosis
    a. Assessment of social determinants of health in idiopathic developmental delay presentation
3. Recognize signs suggestive of need for medical referrals or genetic follow-up
    a. Differentiation of primary diagnosis vs. comorbidity developmental delay presentation
4. Evaluate factors related to hypotonia to aid in pattern recognition for differential diagnosis
    a. Synthesize examination skills for comprehensive PT POC for prematurity
5. Utilize evaluation and follow up data to construct an appropriate prognosis and treatment plan for a differential diagnosis case involving motor delays
6. Application of movement system diagnoses to create PT interventions

Case #3: Toe Walking 4 CH
Session 3/7

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. The physical therapist will be able to decide whether to provide interventions for the individual or refer them to another provider or multiple providers for management, co-management, or consultation
2. Discuss toe walking presentation and potential causes: epidemiology, presentation, and prognosis
    a. Assessment of medical diagnoses vs. sensory or idiopathic toe walking
3. Recognize signs suggestive of need for medical referrals or genetic follow-up
    a. Differentiation of primary diagnosis vs. comorbidity toe walking presentation
4. Evaluate factors related to hypotonia to aid in pattern recognition for differential diagnosis
    a. Synthesize examination skills for comprehensive PT POC for toe walking including utilization of minimal data set documentation items
5. Utilize evaluation and follow up data to construct an appropriate prognosis and treatment plan for a differential diagnosis case involving motor delays
6. Application of movement system diagnoses to create PT interventions
    a. Movement analysis for gross motor skills for children who toe walk

b. Apply understanding of ICF impairments related to interventions to address toe walking

Case #4: The Limping Child 2 CH
Session 4/7

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. The physical therapist will be able to decide whether to provide interventions for the individual or refer them to another provider or multiple providers for management, co-management, or consultation
2. Discuss the limping child presentation and potential causes: epidemiology, presentation, and prognosis
    a. Assessment of medical diagnoses based on pattern of onset of limping
3. Recognize signs suggestive of need for medical referrals
4. Evaluate factors related to a limping child to aid in pattern recognition for differential diagnosis
    a. Synthesize examination skills for comprehensive PT POC for limping child presentation based on prognosis
5. Utilize evaluation and follow up data to construct an appropriate prognosis and treatment plan for a differential diagnosis case involving motor delays
6. Application of movement system diagnoses to create PT interventions

Case #5: Hypermobility and the Clumsy Child 2 CH
Session 5/7

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

12. Review normal musculoskeletal and neuromuscular development of postural control in pediatric population
13. Identify the normal integumentary system components in a healthy child
14. Discuss literature for diagnosing low tone and developmental coordination disorder
15. Perform examination on a child with low tone presentation to determine clinical signs of low tone
16. Select appropriate tests and measures for low tone and developmentally uncoordinated child
17. Develop appropriate treatment plan and interventions including:
    d. Therapeutic exercise
    e. Functional training
    f. Adaptive and assistive devices to support patient and family
18. Review prognosis for development in the uncoordinated low tone child

Case #6: Hypertonia 2 CH
Session 6/7

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. The physical therapist will be able to decide whether to provide interventions for the individual or refer them to another provider or multiple providers for management, co-management, or consultation
2. Discuss hypertonia presentation and potential causes: epidemiology, presentation, and prognosis
    a. Assessment of tone and spasticity in younger and older children
    b. Utilization of HINE scale for standardized tone assessment
3. Recognize signs suggestive of need for medical referrals or genetic follow-up
    a. Differentiation of primary CNS vs. genetic causes of hypertonia
4. Evaluate factors related to hypertonia to aid in pattern recognition for differential diagnosis
    a. Synthesize examination skills for comprehensive PT POC for child with PVL
5. Utilize evaluation and follow up data to construct an appropriate prognosis and treatment plan for a differential diagnosis case involving motor delays
6. Application of movement system diagnoses to create PT interventions

Case #7: Concussion 2 CH
Session 7/7

Readings:
To be assigned

Resident Objectives: At the completion of this **case**, resident will:

1. Recognize signs and symptoms of concussion
    a. Review concussion and post-concussion syndrome for application of its influences in function
    b. Review multisystem involvement of concussion and screening of systems
2. Application of a pediatric vestibular and MSK/Neuro examination: select and perform clinical testing
3. Demonstrate appropriate treatment interventions for vestibular deficits including:
    a. Therapeutic exercise
    b. Functional training
    c. Use of assistive and adaptive equipment
4. Pediatric Concussion Intervention: application, monitoring, and adaptation based on the patient's or client's response(s) to therapeutic exercise including but not limited to:
    a. Endurance and symptom provocation testing
    b. Balance and motor coordination training
5. Review pediatric concussions POC considerations including:

a. Signs and symptoms
b. Multidisciplinary evaluation and treatment
c. Return to sport/activity

Teaching Methods and Learning Experiences

This course will utilize a combination of traditional lectures with various audiovisual materials, group problem solving and discussion, and psychomotor labs. Handouts and learning activities to be accomplished outside of class time may accompany required readings for certain sessions.

Residents are exposed to current theory in motor development and motor control related to the pediatric population that forms the basis for the patient examination, evaluation, and plan of care development. This course provides a foundation for the concepts from prior class series to be applied to patient cases. The course will be a compliment of presentations, group problem solving and discussion, and application in the lab and clinical settings.

This material will be tested via quizzes as well as on all practical examinations and the final written exam. Integration of this information is expected to be demonstrated during the presentations performed by the resident as appropriate.

BROOKS Rehabilitation
INSTITUTE OF HIGHER LEARNING | Pediatric Residency Program

Course Syllabus

****** Non-Violent Crisis Intervention**

Course Description: Nonviolent Crisis Intervention is designed to help individuals prevent and de-escalate potential crisis situations. The participants will complete both didactic and psychomotor components to ensure safe handling of escalating situations in the future.

Course Faculty:
Guest Lecture with NVCI training

Contact Hours:

Online Content	2 HRS
Lecture and Lab	2 HRS

Outline of Content:

4:00-4:15	Unit I
4:15-4:30	Unit II
4:30-4:40	Unit III
4:40-5:00	Unit IV
5:00-5:15	Unit V
5:15-5:30	Unit VI
5:30-5:45	Break
5:45-6:30	Unit VII:
6:30-6:45	Unit VIII
6:45-7:00	Unit IX
7:00-7:30	Unit X
7:30-8:00	Post Test

Objectives:
Upon successful completion of this course, the resident will meet the following objectives.

1. Identify the behavior levels that contribute to the development of a crisis and choose an appropriate staff intervention for each level.
2. Identify useful nonverbal techniques which can help to prevent acting-out behavior.
3. Use verbal techniques to de-escalate behavior.
4. Demonstrate CPI's Principles of Personal Safety to avoid injury if behavior escalates to a physical level.
5. Provide for the Care, Welfare, Safety, and security of all those who are involve in a crisis situation.
6. Understand and develop team intervention strategies and techniques.
7. Recognize the importance of Staff attitudes and professionalism in responding effectively to those in your charge.
8. Apply the material covered in training to real-life situations.
9. Find was to use the time after a crisis as a step toward preventing future crises.

10. Use a mode for action after an incident that will bring about necessary closure, debriefing, and re-establishment of a therapeutic relationship with the individuals involved.

Recommended Reading: As assigned

Teaching Methods and Learning Experiences
The residents use interactive methods, presentations, group problem solving and discussion as methods of inquiry.

This material will be tested on the final written exam as well as on all of the practical examinations. Integration of this information is expected to be demonstrated during patient interventions.

Effective Communication: Live Simulation

Course Description: This simulation requires a PT resident to speak with a concerned parent about prognosis for her or his child with torticollis and plagiocephaly. The PT resident will have a written patient case with which to familiarize themselves. The scenario is set up so that the PT resident has "evaluated" the patient, and the parent wants to understand the role physical therapy plays in their child's treatment. The conversation is started by the parent. The parent will ask the PT resident what they found in their evaluation and specifically how that influences prognosis for resolution of these diagnoses. This would be a typical family-centered conversation between a pediatric physical therapy and parents in an outpatient setting.

Purpose: The purpose of this simulation is to provide a pediatric physical therapy resident an opportunity to practice family-centered communication and education on prognosis for a diagnosis with the utilization of research and clinical practice guidelines.

Modality: Synchronous, live, simulation using video recording

Course Faculty:
Caroline Scott PT, DPT, PCS
Guest Participants as needed

Contact Hours: 4 hours

Course Objectives:

- The residents will design, direct, and implement a learner-centered educational summary to a parent on the prognosis of the patient.
- This will include analyzing information from a clinical exam and integrate appropriate resources to substantiate the resident's response
- The residents will apply contemporary principles of evidence-based practice and knowledge translation in patient and client management by conveying relevant information in a concise and clear manner to the parent
- The resident will demonstrate professional and respectful communication skills
- Residents will adapt communication to meet the educational/cognitive level and psychosocial needs of the patient or client/family/caregiver regarding physical therapy findings and prognosis