PHTH 551 Physical Therapy Neurological Rehabilitation

Credits: 4

Prerequisites: For the students entering the qualifying year of the M.Sc. (A) PT program, knowledge of basic neuroanatomy and neurophysiology is required. Self-directed learning modules in basic neuroanatomy and neurophysiology will be available to students once registered.

For students currently registered in the B.Sc. Rehabilitation Science (major PT) program, successful completion of POTH 455 and ANAT 321 is required to register for PHTH 551.

Instructors:
Co-coordinator: Claire Perez, PT, MSc
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Clinical instructors: Michael Trivino, PT, MSc and David Akeneke, PT, PhD

Teaching assistants: Marco Bühler, Mehmet Inceer, Liam Liu, Hayati Joshi

Other instructors: Jill Boruff (liaison librarian), Isabelle Gagnon, PT, PhD, Allison Jacobson MSc PT, Michel Danakas PT and Adriana Venturini, PT, MSc.

Access to Instructors: email and by appointment preferred

Course Description: This four-credit course introduces the principles of neurological rehabilitation pertinent to physical therapy. By emphasizing the fundamentals of neuro-assessment, problem analysis, clinical reasoning, treatment planning and progression in various neurological conditions, this course builds a conceptual framework that continues into the winter semester course PHTH 561 where more conditions and treatment methods will be presented. The fall semester course PHTH 551 incorporates the foundations of best evidence, informed practice, rehabilitation science, motor learning and neuroplasticity to develop a client-centered approach for the evaluation and management of neurological impairments and dysfunctions. A “problem-solving” approach to treatment will be emphasized (as opposed to based on medical condition or diagnosis.)
**Course Structure:** The course includes two 3-hour classes per week for 13 weeks. Both weekly lectures and laboratory sessions (labs) or clinical reasoning workshops (CRW’s) in smaller group format provide the theoretical knowledge base and the opportunity for clinical skill development and practice. There are three clinical site visits (2 shadowing and 1 hands-on interaction with patients). Additionally, optional open labs where an instructor is present for clinical skills practice and assistance for developing clinical reasoning skills.

**Learning Objectives:** Following attendance and active participation in lectures, labs, CRW’s and clinical site visits, the student will be able to achieve the following core competencies for physiotherapists\(^1\) in the domains of physical therapy neurorehabilitation practice for sensorimotor dysfunctions as discussed in this course.

**Physiotherapy Expertise:**

1. recognize the principles of neurological rehabilitation across the life span and explain the underlying assumptions and scientific basis for intervention.
2. appraise the principles of normal development and aging to apply basic neuroscience concepts.
3. apply the International Classification of Functioning (ICF) model/framework to neurological populations and recognize the individual bio-medical, psychological, social, environmental and contextual factors which can influence health, treatment, rehabilitation and disease management.
4. outline the essential pathophysiology and basis for sensori-motor dysfunctions and evidence-informed treatment for selected adult neuromuscular conditions (ie. Guillain Barré Syndrome, Multiple Sclerosis, Amyotrophic Lateral Sclerosis, Post-polio Syndrome) as well as for traumatic and non-traumatic lesions of the spinal cord.
5. perform components of a physical therapy neuro-assessment (including postural and balance control, motor (tone) and sensory evaluations, and functional mobility assessments) and interpret assessment results.
6. appraise the results/findings from initial and on-going clinical assessments; demonstrate basic clinical reasoning, problem-solving abilities and sound rationales for goal setting, treatment planning, as well as for treatment modifications and progressions, for the sensorimotor dysfunctions discussed to date.
7. develop and demonstrate basic clinical skills related to: the performance of selected assessment procedures; basic treatment methods (hands-on skills, task-oriented approaches, basic neurofacilitation techniques and electrical stimulation application),

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\(^1\) Competency Profile for Physiotherapists in Canada (2017).
Communication:

8. appraise information and communication technologies that are relevant to neurorehabilitation.
9. document neuro-assessment results (impairments, activity limitations & participation restrictions), analysis of results, clinical impression/prognosis, treatment goals and intervention plans with skill and competency, using the SOAPIE*2 framework.

Collaboration:

10. comprehend how the interprofessional team can enhance the management of the sensorimotor dysfunctions discussed to date (ie. Guillain Barré Syndrome, Multiple Sclerosis, Amyotrophic Lateral Sclerosis, Post-polio Syndrome as well as traumatic and non-traumatic lesions of the spinal cord.)
11. develop skills in negotiating within a team and dealing with conflict.

Management:

12. ensure the use of safe and effective techniques during laboratory sessions and clinical site visits.

Leadership:

13. explain interventions for the prevention of functional limitations and to promote health in populations at risk of falls due to sensorimotor dysfunctions discussed to date.

Scholarship:

14. demonstrate an evidence-informed choice and application of selected standardized assessment tools and (re-) evaluation techniques for neurological adult populations.

Professionalism:

15. develop and demonstrate professional and effective communication (verbal, non-verbal and written) during both the assessment and application of treatment for selected neurological conditions across the lifespan.
16. demonstrate behaviours that favour respect for clients’ dignity and autonomy during clinical site visits & during teaching sessions.

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*2 S = subjective, O = objective, A = assessment/analysis, P = plan, I = Intervention, E = evaluation of effectiveness
Instructional Methods:

Lecture: Didactic lectures with assigned readings and power point presentations available through MyCourses.

Labs: Hands-on practical skill laboratories for clinical assessment and some basic treatment techniques. Preparatory work/reading is required. Attendance is compulsory.

Clinical reasoning workshops (CRW): Generally case-based workshops where problem-solving skills are practiced. Preparatory work/reading is required. Attendance is compulsory.

Clinical site visits: With the guidance of a physical therapist, students visit two of the following health care settings to observe neurological assessments and treatments: acute care, in-patient rehabilitation, out-patient, pediatric or a community setting. One other clinical site visit takes place during the spinal cord injury module for hands-on assessment and treatment skills. Attendance is compulsory. A clinical report is submitted after the first 2 visits.

Open labs: These are optional labs for students to practice the learned hands-on skills. Case studies are available for students to develop their clinical reasoning skills and practice, in a supported environment, their assessment and intervention techniques. The labs are staffed by clinical instructors or teaching assistants.

Neurophysiology self-learning modules: Neuroanatomy & neurophysiology self-learning modules are available through MyCourses for students who do not have this basic knowledge. They are based on content found in POTH 455.

Instructional videoclips are a key component used in all sessions.

The course IPEA 500 called Roles in Interprofessional Teams takes place within PHTH 551 class-time. Each student will attend one session.

Course Content:

Refer to MyCourses for details of weekly schedule and content. Below is an outline of major topics discussed.

- Frameworks for neurological rehabilitation and models of clinical reasoning and care
- SOAPIE format to facilitate learning charting skills, problem analysis, clinical impression, planned intervention and progress notes
- Concepts and application of evidence-informed practice
- Normal development and movement acquisition across the lifespan
- Motor control & motor learning principles
- Control of balance and posture
• Control of mobility and gait functions
• Assessment of basic sensory function
• Assessment & management of muscle tone dysfunctions
• Functional mobility assessment and training using neuro-facilitation approach (ie. PNF)
• Assessment and management of specific adult neuromuscular diseases, neuro-degenerative conditions and spinal cord injury.
• Basics of electrical stimulation

Course Materials:
Coursepack PHTH 551 available through McGill bookstore.

Required textbook can be purchased through the McGill bookstore. The following textbook is also required for PHTH 561:

MyCourses contains additional required readings for labs and CRW.

Recommended:


Other textbooks, suggested readings, articles and websites may be added. The textbooks mentioned above are available through course reserves at the Schulich Library of Physical Sciences, Life Sciences and Engineering.

Copyright of course materials: Instructor generated course materials (e.g., handouts, notes, summaries, exam questions) are protected by law and may not be copied or distributed in any form or in any medium without explicit permission of the instructor. Note that infringements of copyright can be subject to follow up by the University under the Code of Student Conduct and Disciplinary Procedures.
Student Assignment and Evaluation:

5%  Report on clinical site visits
    In total two charting reports using the SOAPIE format are submitted. One
    report is submitted for formative feedback and 1 subsequent report is
    submitted for grading. Details will be discussed in class before the clinical
    site visits.

10% Reading Assessment Tests (RAT)
    In total four RATs will be completed by each student as follows:
    RATs are either submitted on MyCourses prior to a lab or completed in-class
    RAT. In-class discussion of answers will follow.

15%  In-class test - 1, Wednesday, October 10th, 14:30-17:30
    Content from Sept. 6th to October 6th.
    The multiple choice in-class test uses a team-based learning approach that
    helps foster shared problem solving and clinical reasoning. Each student
    completes the test individually (10%), and subsequently completes the same
    test with their team (5%). A class discussion follows. Questions are based on
    content to date from lectures, CRWs and lab sessions.

15%  In-class test - 2, Wednesday, November 14th 14:30 – 17:30
    Content from Oct 13th to Nov 9th
    Same format as Test 1.

15%  Evidence-informed practice group project – oral presentation.
    Current topics of discussion in the physical therapy community will be
    assigned to learning teams the first week of class. Powerpoint presentations
    are due on October 5th, prior to the oral presentations, and are graded by
    instructor and peers.

40%  OSCE (Objective Structured Clinical Examination) on Thursday, Dec 20th at
    the McGill Medical Simulation Centre. Performance on 4 practical scenarios
    is evaluated for each student. (total time 48 mins).

Formative evaluation
Students will have an opportunity to participate in a compulsory mock OSCE
exercise at the McGill Medical Simulation Centre on Friday, November 9th 1:30 –
4:30. Formative feedback will be provided after the exercise. Formative feedback is
provided to students on submission of the first SOAPIE report. Formative exercises
will take place during the open labs, the mock OSCE and CRW for students to
become familiar with the OSCE post-encounter probe (PEP) short answer question
format. Attendance to open labs is strongly advised in order to obtain additional
formative feedback on theoretical content, practical & clinical reasoning skills.
Special Requirements for Course Completion and Program Continuation:
For U3 students, in order to pass the course, a grade of at least C+ (60%) must be obtained as a total course mark. For QY students, in order to pass the course, a grade of at least B- (65%) must be obtained as a total course mark. Please refer to the appropriate sections in both undergraduate and graduate calendars on University regulations regarding final and supplemental examinations. This course falls under the regulations concerning theoretical and practical evaluation as well as individual and group evaluation. Please refer to the section on marks in the Rules and Regulations for Student Evaluation and Promotion.

Plagiarism/Academic Integrity: McGill University values academic integrity. Therefore, all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures

Dress Code: Students are expected to demonstrate professional behavior and wear appropriate attire at all times. During lab sessions students are expected to be dressed appropriately for practicing and demonstrating clinical skills.

Attendance: Students who have missed more than 15% of laboratory sessions, clinical reasoning workshops or clinical site visits without a university-sanctioned reason for their absence, will see their final course mark reduced by 10%. Please refer to the section on attendance in the Rules and Regulations guide.

Right to Submit in (English or in) French: In accord with McGill University’s Charter of Students’ Rights, students in this course have the right to submit in English or in French any written work that is to be graded. (approved by Senate on 21 January 2009)

Consequences of Not Completing Assignments as Requested: An individual who does not complete a required assignment and does not have a university recognized reason for deferral would receive a 0 in that portion of the evaluation. Assignments submitted late will receive a penalty of 2% per day late, including week-ends.

Learning environment: As instructors of this course we endeavor to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with us and the Office for Students with Disabilities, 514-398-6009. Please contact the course coordinators to discuss your situation. Concepts of team-based learning are used throughout this course in order to facilitate the development of communication and collaborative skills essential for practice in health care.
**Professional Conduct:** Professionalism and accountability are expected throughout the course of the semester. This includes the on-going respectful nature of teacher-student as well as student-student interactions. Please refer to [Code of Professional Conduct for Physical Therapy Students](http://www.mcgill.ca/spot/programs/pt/bsc-rehabilitation-science) under Student Information

**Technology in class:** Refrain from using your instructional electronic tools (eg: laptop, tablets or cellphone) for social purposes in class. Be respectful of the clinical environment during clinical sites visits and do not use cellphones, tablets, laptops during a site visit.

In the event of extraordinary circumstances beyond the University’s control, the content and/or evaluation scheme in this course is subject to change.