

EDKP-449 Pathophysiology II (3 credits)

Dr Benoit J GENTIL, rm 210

[benoit.gentil@mcgill.ca](mailto:benoit.gentil@mcgill.ca)

**Coordinator:** Benoit GENTIL, PhD

**TA:** Jamie Lov

jamie.lov@mail.mcgill.ca

Office Hours (Dr GENTIL): Monday 1:30-2:30 pm, room 210 Currie

From March 30<sup>th</sup> access through <https://mcgill.zoom.us/j/6268950613>

## Course outline Winter 2020

---

### Lectures:

Mondays and Wednesdays  
2:35-3:55 pm

### **I. COURSE DESCRIPTION**

This course reviews the pathophysiology of selected clinical disorders involving skeletal muscle dysfunction, with a particular focus on the integrative physiological response to acute and chronic exercise. The scientific basis of how the disease process impacts the ability to exercise is reviewed. In addition, we will address whether exercise training can positively impact the disease process itself and/or whether exercise training can reverse some of the effects of physical inactivity that is associated with chronic conditions. Special emphasis will also be put on novel exercise-based interventions and their scientific rationale.

### **II. OBJECTIVES**

- 1) To acknowledge and understand the essential elements of pathophysiology of selected disorders affecting skeletal muscle function in humans
- 2) For each disorder, to acknowledge and understand the impact of the pathological condition on the acute response to dynamic and resistance exercise
- 3) For each disorder, to acknowledge and understand the positive and potentially negative effects of chronic exercise (training) on the disease process
- 4) For each disorder, to apply the knowledge of the exercise response and limitations into the design and implementation of exercise programs for therapeutic purposes

### **III. RECOMMENDED READINGS**

- Skeletal muscle structure, function and plasticity – the physiological basis of rehabilitation. Richard L. Lieber, 3rd edition. 2010: Lippincott Williams & Wilkins (Chapters 1,2,4,5 and 6)
- Clinical Exercise Physiology (3e) Ehrman, Gordon, Visich, Keteyian. 2013: Human Kinetics
- ACSM Exercise Management for Persons with Chronic Diseases and Disabilities (3e) 2009: Human Kinetics
- Journal articles: TBA

### **IV. COURSE REQUIREMENTS**

Dep. of KINESIOLOGY and PHYSICAL EDUCATION  
McGill University

- 1) Midterm (during class time) 30%
- 2) Research paper 30%
- 3) Class participation 5% will be assessed by an assignment consisting in answering a short answer question related to the course. The test will be available on MyCourses.
- 4) Final Exam (during exam period) 35% consists in a MCQ exam covering all the material of this course. The test will be available on MyCourses.

If you cannot attend a class to hand in report, please email to Dr. GENTIL (benoit.gentil@mcgill.ca) prior to lab. Reports received after class will be considered late. Late assignments will incur a penalty: 1 day late = -10%, 2 days late = -30%. Papers received > 2 days after the specified due date will be marked as a zero (0). Unjustified absence will incur a penalty of 10% on all lab reports.

**Research paper:**

Students will be put in teams of 3 to 4 per group, and work collectively to prepare a presentation on the topic of exercise treatment for a disease condition associated with skeletal muscle dysfunction. Through a review of the literature, combined with theoretical knowledge learned throughout this course (and perhaps others), you will propose a unique treatment strategy based on exercise or exercise-related adaptation for one of the neuromuscular conditions covered in class or a condition related to that covered in class. This treatment strategy can NOT be conventional endurance or resistance training, or exactly the same as a strategy covered in one of the class lectures; but it can be a variant of what has been discussed, or it can be an exercise mimetic that affects a cellular signalling pathway involved in exercise adaptation.

Your topic (disease condition and strategy) is due on Jan 28<sup>th</sup>, 2020; and you will get feedback and/or approval from the course instructor during the following week.

**Guidelines for Research Paper:** 12 point font, 1.5 line spacing, 10-15 pages. Use at least 15 references. In your paper, be sure to discuss the following: the disease process of your selection neuromuscular condition, describe the population for which the strategy will be most relevant; what are the main limitations to exercise in your chosen disease population? What has been previously attempted in terms of exercise training, or if nothing, why? What is the rationale for the exercise strategy chosen and what physiological and/or cellular adaptations will the strategy induce? How will the strategy be done? What if any are the risks involved in the strategy? What are the published studies on this topic and what are the results of using the strategy on the neuromuscular population? If there are no published studies, what would you expect as an outcome of the strategy? Also, be sure to integrate what you have learned from class into your presentation. Can this strategy be applied to another neuromuscular disease covered in this course? Please include a page where the contributions of each team member are clearly listed. **Dead line April 3<sup>rd</sup>**

**Grading**

Grades	Grade Points	Numerical Scale
A	4.0	85 – 100%
A-	3.7	80 – 84%
B+	3.3	75 – 79%
B	3.0	70 – 74%
B-	2.7	65 – 69%
C+	2.3	60 – 64%

Dep. of KINESIOLOGY and PHYSICAL EDUCATION  
McGill University

C	2.0	55 – 59%
D	1.0	50 – 54%
F (Fail)	0	0 – 49%

**V. INSTRUCTIONAL METHODS**

**Lecture:** Didactic lectures with assigned readings and PowerPoint presentations available through MyCourses.

**Research articles:** Case-based workshops where problem-solving skills are practiced. Several laboratories require previous preparation. Attendance is compulsory.

**Right to write 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 - see also the section in this document on Assignments and evaluation.) Knowledge of a language is not an object of this course. However, spelling will be considered as well as quality of your writing and may influence your grade.

**VI. COURSE content (tentative semester schedule)**

Date	Lecture Content
Monday, Jan 6th	Intro to course (Dr Gentil BJ)
Wednesday, Jan 8th	Inflammation and skeletal muscle (Dr Gentil BJ)
Monday, Jan 13th	Cancer (Dr Scheede-Bergdahl Celena)
Wednesday, Jan 15	Cancer (Dr Scheede-Bergdahl Celena)
Monday, Jan 20th	Short and long-term effects of chemo/radiation therapy (Dr Gentil BJ)
Wednesday, Jan 22nd	Cachexia and implications of cancer on muscle mass (Dr Gentil BJ)
Monday, Jan 27th	PCOS (Dr Usselman Charlotte)
Wednesday, Jan 28th	PCOS (Dr Usselman Charlotte)
Monday, Feb 3rd	Diabetes (Dr Scheede-Bergdahl Celena)
Wednesday, Feb 5th	Diabetes-related complications (Dr Scheede-Bergdahl Celena)
Monday, Feb 10th	MIDTERM 30%
Wednesday, Feb 12th	Genetics and epigenetic (Dr Gentil BJ)

Dep. of KINESIOLOGY and PHYSICAL EDUCATION  
McGill University

Monday, Feb 17th	'The strongman syndrome' (Dr Conte Talita)
Wednesday, Feb 19th	Muscular Dystrophy (Dr Gentil BJ)
Monday, Feb 24th	Myasthenia Gravis (Dr Gentil BJ)
Wednesday, Feb 26th	Guillain-Barré (Dr Gentil BJ)
Monday, March 2 <sup>nd</sup>	Study break (NO CLASS)
Wednesday, March 4 <sup>th</sup>	Study break (NO CLASS)
Monday, March 9th	Amyotrophic Lateral Sclerosis (Dr Gentil BJ)
Wednesday, March 11th	Charcot-Marie-Tooth disease (Dr Gentil BJ)
<del>Monday, March 16th</del>	Multiple Sclerosis (Jamie Lov) <b>*cancel*</b>
<del>Wednesday, March 18th</del>	Cerebral Palsy (Dr Gentil BJ) <b>*cancel*</b>
<del>Monday, March 23rd</del>	Class presentations <b>*cancel*</b>
<del>Wednesday, March 25th</del>	Class presentations <b>*cancel*</b>
<b>Monday, March 30th</b>	Class presentations <b>*cancel*</b>  <b>Zoom meeting Update on course outline</b>  <a href="https://mcgill.zoom.us/j/6268950613">https://mcgill.zoom.us/j/6268950613</a>
<del>Wednesday, April 1st</del>	Class presentations <b>*cancel*</b>
<del>Monday, April 6th</del>	Class presentations <b>*cancel*</b>
<del>Wednesday, April 7th</del>	Class presentations <b>*cancel*</b>
Monday, April 13th	Easter (NO CLASS)
April 27 <sup>th</sup>	Final exam as a MyCourses quiz
Window of quiz access: 6:15-6:45 pm	Exam (35% final grade)

**VII. Academic integrity**

*McGill University values academic integrity. <http://www.mcgill.ca/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 (see [www.mcgill.ca/students/srr/honest/](http://www.mcgill.ca/students/srr/honest/) for more information).*

Dep. of KINESIOLOGY and PHYSICAL EDUCATION  
McGill University

*L'université McGill attache une haute importance à l'honnêteté académique. <http://www.mcgill.ca/integrity> Il incombe par conséquent à tous les étudiants de comprendre ce que l'on entend par tricherie, plagiat et autres infractions académiques, ainsi que les conséquences que peuvent avoir de telles actions, selon le Code de conduite de l'étudiant et des procédures disciplinaires (pour de plus amples renseignements, veuillez consulter le site [www.mcgill.ca/students/srr/honest/](http://www.mcgill.ca/students/srr/honest/))*

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

For religious holidays please consult McGill policy. <http://www.mcgill.ca/importantdates/holy-days-0/policy-holy-days>

"Additional policies governing academic issues which affect students can be found in the McGill Charter of Students' Rights (The Handbook on Student Rights and Responsibilities is available at [www.mcgill.ca/files/secretariat/Handbook-on-Student-Rights-and-Responsibilities-2010.pdf](http://www.mcgill.ca/files/secretariat/Handbook-on-Student-Rights-and-Responsibilities-2010.pdf))."