

School of Kinesiology  
Faculty of Health Sciences  
Western University

**KIN 4420B - Impact of Exercise During Pregnancy on Chronic Disease Risk  
Winter 2020**

**Instructor:** Dr. Michelle Mottola, Director  
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**Office Hrs:** by appointment

**Lectures:** Monday 2:30pm – 4:30pm

**Room:** SSC-3024

**GTA:** Silar Gardy  
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**Learning Objectives: Upon completion of this course students will:**

- 1) Gain knowledge and understanding of different theories of fetal origins of adult diseases.
- 2) Gain knowledge and understanding of current research in the area of exercise during pregnancy for a low-risk pregnant population.
- 3) Gain knowledge and understanding of current research in the area of how exercise during pregnancy can prevent or be used to treat different disease states.
- 4) Engage in seminar discussions, present orally on a research paper to the class and to evaluate the research literature critically.
- 5) Create and implement an exercise and lifestyle intervention for active low risk pregnant individuals and pregnant individuals with disease risk.

**Topics for Discussion:**

- 1) The “Downside of Upright”
- 2) “Thrifty genotype” and “Thrifty phenotype” – developmental influences of adult diseases. DOHaD – Developmental Origins of Health and Disease.
- 3) DOHaD and adult diseases that may have origin from fetal life.
  - a. Cardiovascular disease
  - b. Obesity
  - c. Type 2 diabetes/Metabolic syndrome
- 4) Impact of exercise during pregnancy on chronic disease risk.
- 5) Importance of active living during pregnancy
  - a. *2019 Canadian Guideline for Physical Activity throughout Pregnancy* and the *Get Active Questionnaire for Pregnancy* – medical screening, exercise guidelines, and safety considerations for low-risk pregnant individuals
  - b. Promoting active living during pregnancy

**Course Evaluation:**

Assignments are due as stated in the course syllabus and will not be accepted late, except under medical or other compassionate circumstances. Submitting a late assignment without appropriate documentation will result in a zero (0) grade. Acceptable reasons might include hospital stays, serious illness, family emergencies (like serious accidents, illness or death) or similar circumstances.

**Mandatory Readings (*Preliminary List*): All required readings will be posted on OWL****Jan. 10, 2022 Topic Introduction and Reading(s):**

- 1) Ackerman J. 2006. The downside of upright. *National Geographic*. 210(1):126-145.
- 2) Mitteroecker P, et al. 2016. Cliff-edge model of obstetric selection in humans. *Proc Natl Acad Sci* 113(51):14680–14685.
- 3) Grossman, R. 2017. Are human heads getting larger? *Proc Natl Acad Sci* 114(8):E1304. (Comment to Mitteroecker et al. 2016)
- 4) Mitteroecker P, et al. 2017 The role of natural selection for the increase of Caesarean section rates. *Proc Natl Acad Sci* . 114(8):E1305. (Comment to Grossman 2017)

**Jan. 17, 2022 Topic****Readings:**

- 5) Prentice AM. 2005. Early influences on human energy regulation: Thrifty genotypes and thrifty phenotypes. *Physiol. Behav.* 640-645.
- 6) Hales CN and Barker DJP. 2001. The thrifty phenotype hypothesis. *Br. Med. Bull.* 60:5-20.
- 7) Prentice AM, Rayco-Solon P, and Moore S.E. 2005. Insights from the developing world: thrifty genotypes and thrifty phenotypes.
- 8) Barker DJP 2004. The developmental origins of adult disease. *J. Am. Coll. Nutr.* 23:588S-595S.

**Jan. 24, 2022 Topic****Readings:**

- 9) Hanson MA, Gluckman PD. 2011 Developmental origins of health and disease: moving from biological concepts to interventions and policy. *Int J Gynaecol Obstet.* Nov;115 Suppl 1:S3-5.
- 10) Martin-Gronert MS, Ozanne SE. 2012 Mechanisms underlying the developmental origins of disease. *Rev Endocr Metab Disord.* Jun;13(2):85-92.
- 11) Wiener SL, Wolfe DS. 2021 Links between maternal cardiovascular disease and the health of offspring. *Can J Cardiol* 2021:1-10 (in press)
- 12) Henry SL et al. 2012 Developmental origins of obesity related hypertension. *Clin. Exper. Pharm. Physiol.* 39 (9), 799-806.

**Jan. 31, 2022 Topic****Readings:**

- 13) Oken E, Gillman MW. 2003. Fetal origins of obesity. *Obes. Res.* 11:496-506.
- 14) Schoonejans J, Ozanne S. 2021. Developmental programming by maternal obesity: Lessons from animal models. *Diab Med* 38:e146694.
- 15) Davenport MH, et al. 2013. Timing of excessive pregnancy-related weight gain and

**Readings:**

- 17) Hales CN, Barker DJP 1992. Type 2 diabetes mellitus: the thrifty phenotype hypothesis. *Diabetologia* 35;595-601.
- 18) Stein A, Obrutu O, Behere R, Yajnik C. 2019 Developmental undernutrition, offspring obesity and type 2 diabetes. *Diabetol* 62:1773-1778.
- 19)



**4. Health and Wellness:**

Information regarding health and wellness-related services available to students may be found at <http://www.health.uwo.ca/>.



**10. Online Etiquette:** Some components of this course will involve online interactions. To ensure the best experience for both you and your classmates, please honour the following rules of etiquette:

- please “arrive” to class on time
- please use your computer and/or laptop if possible (as opposed to a cell phone or tablet)
- ensure that you are in a private location to protect the confidentiality of discussions in the event that a class discussion deals with sensitive or personal material
- to minimize background noise, kindly mute your microphone for the entire class until you are invited to speak, unless directed otherwise
- [suggested for classes larger than 30 students] In order to give us optimum bandwidth and web quality, please turn off your video camera for the entire class unless you are invited to speak
- [suggested for cases where video is used] please be prepared to turn your video camera off at the instructor’s request if the internet connection becomes unstable
- unless invited by your instructor, do **not** share your screen in the meeting

The course instructor will act as moderator for the class and will deal with any questions from participants. To participate please consider the following:

- if you wish to speak, use the “raise hand” function and wait for the instructor to acknowledge you before beginning your comment or question
- remember to unmute your microphone and turn on your video camera before speaking
- self-identify when speaking.
- remember to mute your mic and turn off your video camera after speaking (unless directed otherwise)

General considerations of “netiquette”:

- Keep in mind the different cultural and linguistic backgrounds of the students in the course. Be courteous toward the instructor, your colleagues, and authors whose work you are discussing.
- Be respectful of the diversity of viewpoints that you will encounter in the class and in your readings. The exchange of diverse ideas and opinions is part of the scholarly environment. “Flaming” is never appropriate.
- Be professional and scholarly in all online postings. Cite the ideas of others appropriately.

Note that disruptive behaviour of any type during online classes, including inappropriate use of the chat function, is unacceptable. Students found guilty of Zoom-bombing a class or of other serious online offenses may be subject to disciplinary measures under the Code of Student Conduct.

**11. Classroom Behaviour:** Class will begin promptly at the time specified at the top of page one of this syllabus. In the event that you must arrive late, please enter the classroom with a minimal disturbance to the class. Please keep all electronic devices on silent and avoid distracting classmates.

## **12. Student Code of Conduct**

The purpose of the Code of Student Conduct is to define the general standard of conduct expected of students registered at Western University, provide examples of behaviour that constitutes a breach of this standard of conduct, provide examples of sanctions that may be imposed and set out the disciplinary procedures that the University will follow. For more information, visit <https://www.uwo.ca/univsec/pdf/board/code>