COURSE EPIB-671: CANCER EPIDEMIOLOGY AND PREVENTION

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SCHEDULE FOR 2014: June 9, 11, 13, 16, 18, 20 (Mon/Wed/Fri), 1:00 pm to 5:00 pm

LOCATION: Gerald Bronfman Centre, 546 Pine Avenue West, Basement Seminar Room

OBJECTIVES

1) To review key concepts concerning carcinogenetic mechanisms and pathogenesis with a view on formulating hypotheses for epidemiologic studies of cancer etiology and prognosis.

2) To review the knowledge concerning the occurrence and the causes of human cancers and the means for preventing them.

3) To examine the role of epidemiology in the study of cancer causes and in the evaluation of preventive strategies.

COURSE DESCRIPTION

The last five decades have witnessed enormous progress in the fight against cancer, much of which stemming from direct contributions from epidemiology. Since the advent of the case-control and cohort study designs in the 1950s and of the methods of regression modeling that provided the framework for population risk assessment in the 1970s and 1980s, cancer epidemiologists have provided much of the evidence for contemporary prevention strategies. These include the control of the tobacco smoking pandemics and public and professional education concerning alcohol drinking, dietary practices, occupational and environmental exposures, and prevention of cancer-associated infections. In the 1980’s, epidemiologic investigations that unveiled the protective role of specific dietary habits, such as fruit and vegetable consumption, have provided the rationale for large randomized intervention trials of chemopreventive strategies. Epidemiologists have also played a key role in the design and conduct of intervention trials and prospective studies of novel cancer screening tools, which helped to launch the era of evidence-based medicine.

The course will explore the common epidemiologic approaches to studying etiologic relations in carcinogenesis and for assessing the efficacy of cancer prevention interventions. Emphasis will be given on both molecular and social epidemiology domains with examples of different study designs and data analysis methods and of the impact of measurement error and other biases.

This course is intended for graduate students in epidemiology, oncology residents and fellows, and other health professionals who need an overview of the substantive and methodological contributions of epidemiology in cancer etiology and prevention.

PREREQUISITE: An introductory epidemiology course at the graduate level or permission of the instructor.

CREDITS: Academic: 2, CME: 26

COURSE FORMAT: Interactive lectures, student presentations, and discussion of articles; take-home exam with multiple-choice and essay-type questions.
GRADING: 50% for the student presentation and 50% for the final take-home exam

TOPICS TO BE COVERED

- **Molecular and cellular basis of carcinogenesis**

- **Descriptive epidemiology:**
  - Burden of cancer: worldwide and Canada
  - International variations
  - Time trends in North America

- **Epidemiology vs. other approaches for evaluating carcinogenicity**
  - Experimental and epidemiologic approaches
  - Defining causality: the perspective of regulatory agencies

- **Epidemiologic methods**
  - Common framework for identifying causes and prognostic factors

- **Causes of cancer: Paradigms and murky areas**
  - Lifestyle: Tobacco smoking
  - Biological environment: infections
  - Dietary influences
  - Occupational and environmental exposures

- **Cancer prevention**
  - Primary: reducing the impact of risk factors; key studies
  - Secondary: the role of screening; interpreting biases

BIBLIOGRAPHY

**General overviews:**

Canadian Cancer Society: Canadian Cancer Statistics 2014, Toronto, Canada, 2012 (and previous ones, all accessible as PDF documents from the Canadian Cancer Society’s website).


Websites that provide descriptive cancer epidemiology information used in the course:

International Agency for Research on Cancer: http://www-dep.iarc.fr/

US National Cancer Institute’s Surveillance Epidemiology and End Results: http://seer.cancer.gov/

American Cancer Society: http://www.cancer.org/docroot/stt/stt_0.asp


ARTICLES FOR DISCUSSION IN CLASS WITH RESPECTIVE TOPICS TO BE ILLUSTRATED:

The dilemmas of the epidemiologic approach:

Taubes G. Epidemiology faces its limits. Science 1995;269:164-169 (and letters to the editor that followed) (although it appeared nearly 20 years ago this article captures well the perceptions that the public and other biomedical scientists have about epidemiologic research; many of the issues that are discussed refer to cancer epidemiology dilemmas) (if you are interested in further writings from this author read his NY Times essay at: http://www.nytimes.com/2007/09/16/magazine/16epidemiology-t.html?scp=1&sq=Gary+Taubes&st=nyt

Using mediated analysis to infer causal and prognostic relations:


The following two articles will not be discussed in class but will be used to illustrate additional points on mediated analysis:


Hybrid studies using ecologic level variables:


Large-scale cohort studies:


STUDENT PRESENTATIONS:
One session will be devoted to the student presentations. Please consider the following rules for the choice of topic and style of presentations:

1) Presentations must be in the theme of "cancer epidemiology and prevention". Examples of acceptable topics include: geographical or temporal variation and determinants of cancer burden, overview of a particular proven or proposed etiologic factor (or of classes of related factors, e.g., diet, occupation, infections, etc.); overview of the technology for screening of any given cancer; overview of preventive strategies; methodological issues on general interest. It would be acceptable to present on one’s own work or research if it fits into this topic.

2) It must be an overview of a pertinent topic or a particular problem that can use epidemiologic approaches. If in doubt, check with the course coordinator to verify the appropriateness of the theme.

3) It must NOT be a presentation of a single article, as in a typical journal club. However, it would be acceptable to present on a particular problem raised by one or more studies, provided that the presentation will elaborate in more depth about the problem or state of controversy;

4) It must NOT be about cancer therapy only;

5) The presentation should be viewed as if the student had been invited to give an authoritative talk on the chosen theme to an audience of peers at a national or international conference;

6) Presentations must be done in the allotted time (10 minutes but it could vary depending on the class size) with an extra 2-5 minutes allowed for questions;

7) Golden rule: not more than one slide per minute; a typical 10 minute presentation should have 10 slides or less;

8) PowerPoint slide sets must be emailed to the instructor at least 24 hs before the presentation day so that the files will be uploaded to the computer ahead of time.

FINAL EXAM:

In the last day of class students will receive a hardcopy of the take-home exam with multiple-choice and essay-type questions. They will have 7 days to return the answers by email to the instructor. Instructions are given in the cover page of the exam.

MCGILL UNIVERSITY’S POLICY:

“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 (see http://www.mcgill.ca/deanofstudents/plagiarism for more information).”

“If you have a disability please contact the instructor to arrange a time to discuss your situation. It would be helpful if you contact the Office for Students with Disabilities at 514-398-6009 before you do this.”

“Additional policies governing academic issues which affect students can be found in the McGill Charter of Student’s Rights and Responsibilities (on-line at http://www.mcgill.ca/deanofstudents/rights/).”

Please keep in mind the above policies when preparing your presentations. You must give credit to the sources of illustrations and data, citations to previous work, or statements that you make in your presentation slides and when writing the exam.

Please be sure to submit your electronic course evaluation via your Minerva account (mcgill.ca/Minerva) or via the Mercury Online Evaluation menu.