

Epi 5126: Introduction to Healthcare Epidemiology 2009-10

This course is a Master's level course designed to complement currently existing courses within the Department of Epidemiology and Community Medicine, and to permit students to obtain an overview of relevant concepts in healthcare epidemiology.

Aims of the Course

At the end of this course, students will:

- 1) have acquired knowledge regarding issues and controversies specific to infection control and healthcare epidemiology;
- 2) understand the applications of classic epidemiologic and statistical methods within the healthcare setting;
- 3) be able to critically assess and evaluate interventions and new developments in infection control.

Students will be expected to acquire and apply the following knowledge:

- 1) governance of and administrative controls in the healthcare system, specifically related to public health and infection control
- 2) the roles and administration of infection control and risk management / quality assurance programs within a healthcare facility;
- 3) methods of adverse outcome (includes infectious disease and nosocomial infection) surveillance within healthcare facilities;
- 4) study design and research methods in infection control;
- 5) outbreak investigation;
- 6) infection risks in special populations / specialized settings within the healthcare system;
- 7) prevention and risk management of adverse outcomes within the healthcare setting;
- 8) awareness of emerging issues within infection control;
- 9) regulatory guidelines and accreditation for healthcare facilities.

Course Coordinators

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Requirements for Course Enrollment

Students should have demonstrated knowledge of epidemiologic principles as well as basic statistics (for example, practical experience applying these principles, or formal training such as advanced undergraduate or graduate courses, or equivalent). Interested students who are uncertain about their level of knowledge in these areas should contact the course coordinators to discuss this further.

Course enrollment may be limited. Students who are registered in the MSc program in Epidemiology and Community Medicine will take priority, followed by students registered in other UO graduate programs. Enrollment / acceptance of a spot will assume requisite knowledge as outlined above.

Course Details

13 – 3 hour sessions during the winter term.

Dates and time: Fridays between 1300 and 1600, starting September 11 and ending December 4.

Location: Room 2111, Health Sciences Building (Roger Guindon Hall)

Parking: payment required, at Roger Guindon Hall.

Content will be delivered in as formal seminars / lectures, and student presentations on selected topics.

Timing of specific lectures and content are subject to change.

Course Outline

1. Introduction to Healthcare Epidemiology; Nosocomial Infections; Introduction to Microbiology (Sept 11)
 - Intro to healthcare epidemiology
 - Historical perspectives of public health / infection control
 - Healthcare delivery in the 21st century
 - Role of healthcare epidemiology in healthcare facilities
 - Definitions of nosocomial infections
 - Overview of nosocomial infections and adverse outcomes
 - Basic microbiology

2. Role of the Microbiology Laboratory in Infection Control; Prevention of Infection in Healthcare Settings Part I (Sept 18)
 - Microbiologic methods used in healthcare epidemiology
 - Hand hygiene
 - Transmission of infectious pathogens / microorganisms
 - Infection control risk assessments and screening
 - Isolation precautions – transmission based

3. Prevention of Infection in Healthcare Delivery Part II; Administrative Aspects of Hospital Epidemiology (Sept 25)
 - Principles of immunization, evidence for immunization
 - Occupational health requirements / recommendations and legislation for protection of healthcare workers
 - Post-exposure management of infectious disease exposures
 - Essential requirements for infrastructure, essential activities – in and outside of hospitals
 - Setting up a hospital epidemiology program
 - Professional practice standards for infection control professionals
 - Legislation related to infection control programs

4. Epidemiology and Surveillance (Oct 2)
 - Rates, determining numerators and denominators
 - Sources of data, limitations, ethical issues
 - Data collection in healthcare settings and data management
 - Surveillance – purpose, overview of methods, limitations

5. Emerging Infectious Diseases; Bioterrorism (Oct 9)
 - Surveillance for emerging pathogens
 - H1N1 (swine) / pandemic influenza
 - Bioterrorism

6. Infection Control in Special Areas Part I (Oct 16)
 - Infection control in ambulatory care and outpatient settings
 - Infection control in endoscopy
 - Infection control in dialysis
 - Infection control in pediatrics

7. Midterm / Infection Control in Special Areas Part II (Oct 23)
 - Midterm exam (1.5 hours)
 - Infection control in surgery; surgical site infections
 8. Environmental Infection Control; Sterilization / Disinfection; Product Evaluation (Oct 30)
 - Facility design, construction and renovations
 - Facilities and physical plant: ventilation, water, waste disposal
 - Environmental infection control: environmental disinfection
 - Central sterile supply, including equipment reprocessing
 - Biomedical engineering, product evaluation
 9. Role of Pharmacy in Infection Control; Infrastructure of Infection Control Programs (Nov 6)
 - Antimicrobial resistance and stewardship
 - Antimicrobial resistant organisms (MRSA, VRE, ESBLs)
 - *Clostridium difficile*
 10. Patient Safety and Hospital Accreditation (Nov 13)
 - Quality improvement / quality assurance
 - Overview of patient safety, relation to infection control
 - Measurement of non-infectious adverse events
 - Knowledge translation and changing behaviour
 - Hospital accreditation requirements within infection control and patient safety
 11. Healthcare Administration and Infection Control Part I; Healthcare-acquired Infections (Nov 20)
 - Hospital administration perspective
 - Central venous catheter-related bloodstream infections
 - Ventilator associated pneumonia
 12. Healthcare Administration and Infection Control Part II; Public Reporting (Nov 27)
 - Federal government perspective
 - Regional public health perspective
 - Public reporting of healthcare-acquired infections
 13. Statistics and Applied Epidemiologic Methods; Outbreak Investigation (Dec 4)
 - Measurement of risk
 - Study design in healthcare epidemiology
 - Outbreak investigation
- Hospital Tour (date TBD if sufficient interest)
- For those who are not familiar with the hospital setting and who would like to see some of the areas that we have discussed, we can try to arrange some visits to specific areas that may include: a construction site; central processing (sterilization and disinfection area); intensive care unit; outpatient clinics; dialysis unit; etc.

Course Evaluation

There will be no final exam for this course.

Homework assignments DUE WEEK 5 AND WEEK 10: 20% each

- Homework will be distributed at least one week prior
- Assignments are expected to be completed independently (i.e. students must not work together)
- Any available resources can be used to complete assignments

Mid-term exam (1.5 hours), WEEK 7: 25%

- Mid term will be based on content from the first 6 weeks of classes and will consist of short answer questions.
- Duration: 1.5 hours.

Term paper DUE WEEK 12: 35%

- Topics for term papers must be approved by the course coordinators and must be related to some aspect of healthcare epidemiology; some suggested topics are listed below (see next section).
- More than one student may select the same topic, but work is expected to be independent.
- Topics must be identified by Week 7.
- Term papers must be appropriately formatted using an accepted word processing program (handwritten papers will not be accepted), and should be referenced appropriately.
- Submission may be in hard copy or electronically (via e-mail).
- Total length: 15-20 pages including references.

Format of Term Paper and Suggested Topics

Students will identify an important issue in hospital epidemiology and discuss the evolution of the issue over time, challenges that it currently presents to hospital epidemiologists, and currently used and / or proposed mechanisms of improving practice and reducing risk (patient, healthcare worker or other risks) associated with the issue. The focus may be on either the topic itself, or on specific processes related to the topic.

There should be some concrete evidence available for the topic selected, although this will often be controversial.

Examples (topics do NOT have to be selected from this list):

- Emerging febrile respiratory infections
- Creutzfeldt Jacob disease
- Surveillance for surgical site infections

- Healthcare workers infected with blood borne pathogens
- Patient safety issues
- Infection control issues in high risk populations (e.g. premature infants, transplant recipients)
- Improving hand hygiene compliance among healthcare workers
- Respiratory protection for infectious diseases
- Ethical issues in infection control research

Text and Readings

Reference text: is available in the University of Ottawa Health Sciences Library, as well as in the ECM office (with Fay Draper). This text is NOT required for the course.

Lautenbach E. Practical Handbook for Healthcare Epidemiologists. Slack Incorporated, 2004. ISBN 1556426992. Available through the University of Ottawa Medical Bookstore or online through Chapters or Amazon. Cost approx \$125.

Additional references will be distributed either in hard copy or electronically as required.