



**CUMMING SCHOOL OF MEDICINE  
UNDERGRADUATE MEDICAL EDUCATION (UME)  
Medical Doctor Program (MD)**

## **COURSE OUTLINE**

<b>Course:</b>	<b>MDCN 345</b>	<b>Classroom:</b> <b>Online in OSLER</b>
<b>Course Name:</b>	Applied Evidence Based Medicine I	
<b>Day &amp; Time:</b>	Detailed Scheduled located Online in OSLER	

Course Chairs:	Fariba Aghajafari Kerry McBrien	<b>Email:</b> <a href="mailto:fariba.aghajafari@ucalgary.ca">fariba.aghajafari@ucalgary.ca</a> <b>Email:</b> <a href="mailto:kamcbrie@ucalgary.ca">kamcbrie@ucalgary.ca</a>
UME Program Coordinator:	Nicolle Begert	<b>Email:</b> <a href="mailto:aebm@ucalgary.ca">aebm@ucalgary.ca</a>

<b>Student Rep:</b>	Ann Subota	<b>Email:</b> <a href="mailto:ann.subota@ucalgary.ca">ann.subota@ucalgary.ca</a>
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Due to the effects of COVID-19, the MD program pre-clerkship curriculum has been modified to comply with University of Calgary COVID-19 regulations.

Course large group content is being delivered online as a combination of podcasts and live events via Zoom.

Small groups are also delivered via Zoom.

Midterm exams/quizzes will be written online via Dolphin.

Final MCQ examinations will be written in person following UME protocols for exams which include the use of multiple theatres (no more than 30% capacity), spaced seating ensuring appropriate social distancing of students and the use of PPE by all parties during the exam.

OSCE examinations will also be in person and adhere to CSM approved UME social distancing and PPE protocols.

As of September 1, the curriculum will be mixed delivery which will include some in-person teaching for hands-on skills that cannot be taught via online means.

These include courses/units such as Physical Exam, Procedural Skills, Communications, as well as clinical teaching such as clinical correlation, electives and Family Medicine Clinical Experience.

For these events, students will be individually assigned or in small groups and adhere to social distancing and PPE regulations as outlined by UME.

## Course Description

Applied Evidence Based Medicine (AEBM) teaches critical appraisal of literature and how to apply evidence to practice. It is also an opportunity to explore an area of particular interest to each student. AEBM is split into AEBM I and AEBM II. AEBM I is a first year course and runs August – March in Year 1. The course is designed to provide an introduction to evidence based medicine through lectures and small groups, where concepts of clinical informatics and critical appraisal will be presented. AEBM II runs in second year and provides structured elective time, during which the concepts of evidence based medicine are applied. Further detail regarding AEBM II will be provided toward the end of Year 1 in a separate course outline.

**Course Hours:** (40 hours)

## Course Overview

AEBM I is a series of lectures and small groups. Two quizzes will be used to assess understanding of evidence based medicine (EBM) concepts. Following this, students will participate in a longitudinal elective experience, which will be completed in Yr 2 (MDCN 445, see separate course outline).

The introductory lectures on Monday, August 10, 2020 will be followed by a series of monthly lectures and their associated small group sessions. There is a deliberate effort to align the clinical topics of these sessions with the topics addressed in the year one courses, in order to enable “background” context for the “foreground” discussion of the evidence based literature.

The monthly lectures will be directed at acquiring EBM skills in diagnosis, therapeutic interventions, prognosis, systematic reviews, and guidelines (Appendix A). The small group session complementing certain lectures will occur the following week. In the small group sessions students will critique selected articles using a guided approach, lead by 2-3 students and facilitated by a preceptor. The students will also be given time to work on a critically appraised topic (see below).

This course expects students to not only develop critical appraisal skills, but also to present the information for critique by their peers, within settings that emulate the “rounds” used for teaching at the residency level. During the small groups two to three students will be responsible for leading the discussion based on the paper provided.

Students will independently prepare a Critically Appraised Topic (CAT – Appendix B), that appraises a paper selected to address a clinical question. The CAT assignment will be done during the lecture series.

**What is a CAT – Critically Appraised Topic?**

*“A CAT is an instrument for maintaining and retrieving relevant evidence. It summarizes and condenses the process through which a well-formulated question leads to a literature search, selection of relevant primary studies, critical appraisal of the studies’ validity, results, and applicability, and the reviewer’s conclusions regarding the original question.”*

*[excerpted from Wyer PC: The critically appraised topic: Closing the transfer gap. Ann Emerg Med November 1997;30:639-640.]*

CATs should be anchored in a patient problem that the student has identified and the CAT should be useful in its direct application to the patient problem. During residency a CAT may be used as a vehicle for physician education and communication. In practice, whether in community hospitals or teaching programs, CATs form a bridge between research information and patient care. In our undergraduate program at U of C they are a tool for sharpening critical appraisal skills while bringing pertinent literature to bear on patient care during your early formative clinical training.

### **Prerequisites**

Not applicable to all courses in our program.

### **Supplementary Fees/Costs**

- Lab Coat
- Stethoscope
- iClickers

### **Learning Objectives**

All learning objectives are described in Appendix A.

### **Relationship to Other Courses**

N/A

## Course Resources

The course will draw on a number of resources though any testable concepts will be covered in lectures and small groups. The following is a list of online texts and library resources you can refer to throughout the course.

### Online texts:

Straus, S. E., Glasziou, P., Richardson, W. S., & Haynes, R. B. (2019). *Evidence-based medicine: How to practice and teach EBM*. Elsevier. Available through the library at [https://ucalgary-primo.hosted.exlibrisgroup.com/permalink/f/13e4ecq/01UCALG\\_ALMA51730220830004336](https://ucalgary-primo.hosted.exlibrisgroup.com/permalink/f/13e4ecq/01UCALG_ALMA51730220830004336)

Prasad, K. (2013). *Fundamentals of evidence-based medicine*. Springer. Available through the library at [https://ucalgary-primo.hosted.exlibrisgroup.com/permalink/f/1p0s7n7/TN\\_cdi\\_askewsholts\\_vlebooks\\_97881322\\_08310](https://ucalgary-primo.hosted.exlibrisgroup.com/permalink/f/1p0s7n7/TN_cdi_askewsholts_vlebooks_97881322_08310)

### Library resources:

- Library guide: <https://library.ucalgary.ca/guides/mdcn345> - for detailed information about creating PICO questions and searching the literature and other resources
- <http://library.ucalgary.ca/hsl> - Key library site for accessing Medline, Pubmed, Dynamed

## RESEARCH ETHICS

If a student is interested in undertaking an assignment that will involve human subjects, he or she should speak with the Course Chair and consult the CHREB ethics website (<http://www.ucalgary.ca/research/researchers/ethics-compliance/chreb>) before beginning the assignment.

## WRITING EXPECTATIONS

It is expected that all work submitted in assignments should be the student's own work, written expressly by the student for this particular course. Students are referred to the section on plagiarism in the University Calendar ([www.ucalgary.ca/pubs/calendar/current/k-2.html](http://www.ucalgary.ca/pubs/calendar/current/k-2.html)) and are reminded that plagiarism is an extremely serious academic offence.

## Evaluation and Course Requirements

### Evaluation Specifics:

AEBM includes two must pass elements (sections A and B). The evaluation is a composite of quiz scores and the individual CAT assignment. The total score depends on completion of all elements - any item missing will be assigned a 0 (zero). Should a student not meet the MPL, a remedial assignment and/or exam will be arranged, depending on which element(s) were unsatisfactory.

#### **A. Two individual MCQ Quizzes - 35% Quiz 1, 25% Quiz 2**

There are 2 quizzes in the course. One approximately half-way through the lecture series and the other at the end. Each quiz will evaluate the knowledge gained in the lecture series, with content split between the two (Quiz 2 will focus on content delivered in the second half but may draw on concepts introduced in the first half if they are relevant to that content). Each quiz will contain 25-30 questions, with approximately equal distribution across topics dealt with during each of the scheduled sessions, including aspects of information literacy that relate to searching the literature.

**Quiz 1 – December 7<sup>th</sup>, 2020**

**Quiz 2 – March 1<sup>st</sup>, 2021**

#### **B. CAT assignment – 40%**

Each student will work on one Critically Appraised Topic (CAT) and will submit one written CAT. Students will base the CAT assignment on a clinical scenario of their choosing. Templates with required elements will be made available to guide the assignment. Similar templates will be used in small group sessions. The CAT will be marked according to pre-established criteria.

**Due date – February 8<sup>th</sup> @ 11:59 PM**

In the event that a student is unsatisfactory in the assessment, the student will be required to write an MCQ quiz and/or complete a second individual CAT.

## Learning Resources

All lectures, podcasts (if available), small group guides and journal articles will be provide on OSLER.

## Grading

The University of Calgary Medical Doctor Program is a Pass/Fail program. The Grading System that will appear on a student legal transcript is as follows:

Grade	Description
CR	Completed Requirements
RM	Remedial Work Required
F	Fail
I	Incomplete
W	Withdrawal
MT	Multi-Term (Used for Part A Courses that fall under 2 different terms in the calendar year.)

A student's final grade for the course includes both components 1 and 2. It is necessary that each component (1 and 2) be passed separately to earn a final grade of CR.

The following criteria shall generally apply to all written assignments. Instructors responsible for grading specific assignments may add additional criteria.

### Timeliness

In general, dates listed in Core Documents are intended to act as guidelines for assisting students to complete their learning activities and assignments in a timely fashion. However, there are certain due dates that are subject to academic regulations. These include:

### Graded Assignments

Students are expected to submit all major assignments on or before the due dates. Unless prior arrangements have been made, major assignments worth marks submitted after the specified due date will be considered late. **Late major assignments will receive a 0% grade.** Other assignments will not be accepted after the due date.

### Professional Conduct

As members of the University community, students and staff are expected to demonstrate conduct that is consistent with the University of Calgary Calendar. The specific expectations cited in the Calendar include:

- respect for the dignity of all persons
- fair and equitable treatment of individuals in our diverse community
- personal integrity and trustworthiness
- respect for academic freedom, and

- respect for personal and University (or Host Institution) property.

Students and staff are expected to model behaviour in class that is consistent with our professional values and ethics. Students and staff are also expected to demonstrate professional behaviour in class that promotes and maintains a positive and productive learning environment. All students and staff are also expected to respect, appreciate, and encourage expression of diverse world views and perspectives. All members of the University community participating in the BSW Program are expected to offer their fellow community members unconditional respect and constructive feedback. While critical thought, and debate, is valued in response to concepts and opinions shared in class, feedback must at all times be focused on the ideas or opinions shared and not on the person who has stated them.

Where a breach of an above mentioned expectation occurs in class, the incident should be reported immediately to the Associate Dean or his/her designate. As stated in the University Calendar, students who seriously breach these guidelines may be subject to a range of penalties ranging from receiving a failing grade in an assignment to expulsion from the University.

### **Electronic Submission of Course Work**

Most assignments will be submitted via email to the AEBM Program Coordinator, UME unless otherwise stated differently. Assignments may be submitted in PDF, MS Word or Rich Text formats. It is the student's responsibility to confirm with the Program Coordinator that the assignment has been received. This may be done through utilization of the return receipt function available on most email packages, or by a follow up confirmation email to the Program Coordinator.

It is the Program Coordinator's responsibility to reply to any confirmation email from the student, and to inform the student promptly if there are any problems with the file (unable to open attachment, damaged data, etc.). In such cases, it is the responsibility of the student to promptly consult with the Program Coordinator regarding an alternate delivery method (e.g. courier, fax, etc.). It is the student's responsibility to retain a copy of the original document.

### **Completion of Assignments**

Each assignment is designed to develop the student's understanding of a particular concept or topic as part of the larger theme course. Students encountering difficulties completing assignments due to health or other serious factors must contact the Course Chair to arrange a deferral of term work. A Physician/Counsellor Statement to confirm an absence for health reasons may be required.

### **Withdrawal**

See the Academic Schedule for important dates:

<http://www.ucalgary.ca/pubs/calendar/current/academicschedule.html>

## Course Evaluation/Feedback

Student feedback will be sought at the end of each learning session as well as at the end of each course through the electronic UME evaluation tool.

At the end of each learning activity (i.e., Lecture, small group, orientations, etc.), students will be asked to complete online evaluation forms to provide feedback to instructors regarding the effectiveness of their teaching and achievement of the learning objectives. An overall course evaluation will be completed following course completion.

Students are welcome to discuss the process and content of the course at any time with the Course Chairs or Preceptors.

### Policy Information for the MD Program

MD Program Policy link:

<http://www.ucalgary.ca/mdprogram/home/ume-policies-guidelines-forms-tors>

University of Calgary Policy link:

<http://www.ucalgary.ca/policies/>

### Internet & Electronic Communication Device Information

MD Program Policy link:

<http://www.ucalgary.ca/mdprogram/home/ume-policies-guidelines-forms-tors>

### STUDENTS WITH DISABILITIES

It is the student's responsibility to request academic accommodations. If you are a student with a documented disability who may require academic accommodation and have not registered with the Student Accessibility Services, please contact their office at (403) 220-8237, address: MacEwan Student Centre room 452 or email: [access@ucalgary.ca](mailto:access@ucalgary.ca). Students who have not registered with the Student Accessibility Services are not eligible for formal academic accommodation.

**SAFEWALK (403) 220-5333**

Campus security will escort individuals, day or night. Call (403) 220-5333. Use any campus phone, emergency phone or the yellow phone located at most parking lot pay booths.

**IMPORTANT INFORMATION**

The University of Calgary copyright policy has changed. It is the responsibility of each individual to ensure compliance with copyright regulations. Individual questions and concerns should be directed to [copyright@ucalgary.ca](mailto:copyright@ucalgary.ca).

Students may be asked, in all courses, to participate in as subjects in research. Any research in which students are invited to participate will be voluntary, explained in class, and approved by the appropriate University Research Ethics Board.

Cell phones must be turned off in class unless otherwise arranged with the instructor.

Assembly points for emergencies have been identified across campus. The primary assembly point for the Professional Faculties building is the Education Block Food Court. The alternate assembly point is Scurfield Hall Atrium.

The Social Work representative to the Students Union is to be determined ([swsacalgary@gmail.com](mailto:swsacalgary@gmail.com)). The Student Ombudsman's Office can be reached at the [U of C Student Services Website](#)

The Freedom of Information and Protection of Privacy (FOIP) Act indicates that assignments given by you to your course instructor will remain confidential unless otherwise stated before submission. The assignment cannot be returned to anyone else without your express permission. Similarly, any information about yourself that you share with your course instructor will not be given to anyone else without your permission.

You are reminded that academic misconduct, including plagiarism, has extremely serious consequences, as set out in the University Calendar. More information about academic misconduct can be found on page 52 and 53 of the University of Calgary Calendar.

**Emergency Evacuations and Assembly Points**

Assembly points for emergencies have been identified across campus. The primary assembly point for the Health Sciences Centre (HSC) building is HRIC - Atrium. For more information, see the University of Calgary's Emergency Management website: <https://www.ucalgary.ca/risk/emergency-management/plans-and-procedures>

Emergency Evacuation Procedures- <https://www.ucalgary.ca/risk/emergency-management/plans-procedures/emergency-instructions>

In the case of an emergency during exam, immediately stop writing the examination and follow the direction of the invigilator and go to the nearest exit. Students should not gather personal belongings.

<b>APPENDIX A</b> <b>Learning Objectives by Lecture</b>
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**August 10, 2020**

***Introductory Lecture***

Lecture Objectives

Students will:

1. Understand what evidence based medicine is and why it is used
2. Understand the key steps in evidence based medicine
3. Understand the concept of PICO and how it is used to formulate a literature search strategy

***Introduction to Biostatistics***

Lecture Objectives

Students will:

1. Understand the concept of population sampling
2. Be able to interpret a p-value and 95% confidence interval
3. Understand the concept of confounding

**August 31, 2020**

***Introduction to Library Tools and PICO***

Lecture Objectives

Students will:

1. Understand how to use PICO to formulate a searchable question
2. Understand how to form a literature search strategy using the basic principles of database searching
3. Search for primary studies using PubMed Clinical Queries

***Introduction to Study Design and Research Methods***

Lecture Objectives

Students will:

1. Understand the primary types of study design, their advantages and disadvantages
2. Be able to identify sources of bias and how these affect study validity
3. Be able to interpret different measurements of effect

***Therapy***

Lecture Objectives

Students will:

1. Learn to apply the concepts of critical appraisal of a therapy study
2. Be able to interpret the results of a study, including an understanding of size and precision
3. Be introduced to the application of evidence to practice

**October 2, 2020**

***Diagnosis***

Lecture Objectives

Students will:

1. Define pre and post test probabilities of a diagnosis in general terms
2. Describe the diagnostic process including the roles of the medical history, physical examination, and clinical testing
3. Define and calculate test characteristics including: positive likelihood ratio, negative likelihood ratio

**November 2, 2020**

***Prognosis***

Lecture Objectives

Students will:

1. Be able to define prognostic factors and distinguish them from risk factors
2. Be able to consider the applications of research that report disease-specific prognosis
3. Appreciate the derivation and validation of prognostic models

**November 6, 2020**

***Evidence Synthesis and Systematic Reviews***

A) Lecture Objectives

Students will:

1. Understand risk of bias in a systematic review
2. Be able to interpret a forest plot of a meta-analysis and understand the concept of heterogeneity
3. Understand the concept of publication bias

B) Information Literacy Objectives

Students will:

1. Understand where to look for systematic reviews and related studies
2. Understand what's involved in locating studies for a systematic review

**January 4, 2021**

***Guidelines***

A) Lecture Objectives

Students will:

1. Be able to define what a clinical practice guideline (CPG) is and the role it plays in the biomedical literature
2. Be able to recognize and analyze the quality dimensions of a CPG
3. Be able to consider the pros and cons of the CPG enterprise

**February 1, 2021**

***Data informed practice***

A) Lecture Objectives

Students will:

1. Be able to describe how data can be used align practice with best evidence and clinical guidelines
2. Be able to define audit and feedback
3. Be able to formulate clinical questions that are amenable to audit and feedback interventions

<p style="text-align: center;"><b>APPENDIX B</b> <b>CAT Assignments</b></p>
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**Important Dates:**

- 1) **February 8th @ 11:59 PM** – Final written CAT assignment submitted to AEBM coordinator from each student

**CAT OVERVIEW**

The topic of each CAT will be drawn from one of the major areas of ***Diagnosis, Prognosis, Therapy or Systematic Reviews***. The topic should be based on a clinical encounter. The case should be a real patient (anonymized) that presented a clinical dilemma. The clinical scenario will be distilled into an answerable clinical question and further into a PICO statement. The PICO statement will be used to formulate a search strategy and search the literature to identify a single study that helps to answer the clinical question. Students will then go through the process of critical appraisal of the study using the applicable CAT template and make a final interpretation about how the study results apply to the clinical scenario in question.

- Time has been set aside at the end of several AEBM afternoons (after lecture) to work on the CAT assignment. While students are not required to use this time to work on the CAT assignment, they are encouraged to work through the assignment as the lecture series progresses in case questions arise that can be brought to the course chairs during office hours.

The student is responsible for submitting the final written CAT to the AEBM coordinator ([aebm@ucalgary.ca](mailto:aebm@ucalgary.ca)) by **February 8<sup>th</sup> @ 11:59 PM**

**Written CAT assignment**

The written CAT will be guided by templates and will include:

- A statement of the presenting patient problem
- The distilled clinical question
- The PICO expression of the question to be answered
- Details of the literature search
- An appraisal of the selected paper(s) for validity, according to study type

- An interpretation of the results along with their applicability to the patient problem

## **Grading**

A scoring template that addresses the elements below will be used for grading the CAT assignment. A description of the clinical scenario, question, PICO statement and literature search are indicative of the thought process that leads to the selection of a relevant paper. The assessment of validity, results and interpretation in the context of the clinical scenario are indicative of critical appraisal skills and clinical application.

- A clear description of the clinical problem and resulting concise question
- An appropriate PICO statement
- The comprehensiveness and effectiveness of the search strategy (a librarian is available to review all search strategies and provide feedback)
- The selected paper
- Description of study type and methods
- The evaluation of validity factors related to the selected study or studies
- Assessment of the results, in relation to precision and accuracy
- The interpretation of the information with respect to the original patient problem

## APPENDIX D

### Contact List

The following is a list of contacts for the AEBM course.

<b>Unit</b>	<b>Leader and Email Address</b>
Course Chair	Kerry McBrien: <a href="mailto:kamcbrie@ucalgary.ca">kamcbrie@ucalgary.ca</a>
Course Chair	Fariba Aghajafari: <a href="mailto:fariba.aghajafari@ucalgary.ca">fariba.aghajafari@ucalgary.ca</a>
Evaluation Coordinator	Steven Persaud: <a href="mailto:steven.persaud@ucalgary.ca">steven.persaud@ucalgary.ca</a>
Program Coordinator	Nicolle Begert: <a href="mailto:aebm@ucalgary.ca">aebm@ucalgary.ca</a>
Intro to Study Design	Tahara Bhate: <a href="mailto:tdbhate@gmail.com">tdbhate@gmail.com</a>
Intro to Biostats	Jessalyn Holodinsky: <a href="mailto:jkhodi@ucalgary.ca">jkhodi@ucalgary.ca</a>
Diagnosis	Colin Bruce Josephson: <a href="mailto:cbjoseph@ucalgary.ca">cbjoseph@ucalgary.ca</a>
Therapy	Jeffrey P Schaefer: <a href="mailto:jpschaef@ucalgary.ca">jpschaef@ucalgary.ca</a>
Prognosis	Eddy Lang: <a href="mailto:eddy.lang@albertahealthservices.ca">eddy.lang@albertahealthservices.ca</a>
Systematic Reviews	Fariba Aghajafari: <a href="mailto:fariba.aghajafari@ucalgary.ca">fariba.aghajafari@ucalgary.ca</a>
Guidelines	Doreen Rabi: <a href="mailto:Doreen.Rabi@albertahealthservices.ca">Doreen.Rabi@albertahealthservices.ca</a>
Data Informed Practice	Antonia Stang: <a href="mailto:antonia.stang@albertahealthservices.ca">antonia.stang@albertahealthservices.ca</a>
Information Literacy	Nicole Dunnewold: <a href="mailto:nicole.dunnewold@ucalgary.ca">nicole.dunnewold@ucalgary.ca</a>

**APPENDIX E**  
**ATSSL Guidelines**

**PPE REQUIREMENTS**

At a minimum, the following **MUST** be worn by students and staff when in the ATSSL Wet Lab:

<b>FOOTWEAR</b>
Non-Slip with Closed Toes, Closed Sides and Closed Heels (No High Heels)
<b>CLOTHING</b>
Long Pants (No Shorts/Skirts)
<b>PPE</b>
Plastic Apron
Gloves
<b>Please Note:</b>
Aprons and Gloves must be removed and properly disposed of prior to exiting the lab

May 22, 2014  
UME Management/ATSSL

<p style="text-align: center;"><b>APPENDIX F</b> <b>One45 Overview</b></p>
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The MD Program utilizes the One45 Software Program for assessment purposes for all evaluations in Year 1, 2 and 3. Students are able to view completed evaluations online through this software program. Evaluations and assessment data is collected at regular intervals.

It is the student's responsibility to distribute their evaluations to preceptors during any given course and to follow up with preceptors if evaluations have not been completed by the deadline given out by the Undergraduate Medical Education Office.

In addition to assessments and evaluations, One45 is also utilized to evaluate your preceptors and to gather information from students on their learning experiences.

All students are provided training at the beginning of their program in Year 1. This would include a personal log in access code and password.

One45 is used throughout your training in the MD Program (Undergrad) as well as Residency (PGME).

**Website Link to Access One45:** <https://calgary.one45.com/>

**Problems Accessing One45:** Please contact the eLearning Team at [osler@ucalgary.ca](mailto:osler@ucalgary.ca)