



UNIVERSITY OF CALGARY
CUMMING SCHOOL OF MEDICINE

UNDERGRADUATE MEDICAL EDUCATION (UME)
Medical Doctor Program (MD)

COURSE OUTLINE

Course Number:	MDCN 345
Course Name:	Applied Evidence Based Medicine
Dates:	
Schedules and classroom locations:	For pre-clerkship: Year 1 & 2 timetable is here https://cumming.ucalgary.ca/mdprogram/current-students/pre-clerkship-year-1-2/timetable Detailed scheduled is located online in OSLER

	Name	Email
Course Chair:	Fariba Aghajafari	fariba.aghajafari@ucalgary.ca
Course Chair:		
Evaluation Rep:	TBD	
UME Program Coordinator:	Nicolle Begert	aebm@ucalgary.ca

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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, exams/quizzes will be in person for this course.

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.
Please refer to the University Calendar: http://www.ucalgary.ca/pubs/calendar/current/medicine.html#8554

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 Thursday, August 19, 2021 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 in the MD program.

Supplementary Fees/Costs
<ul style="list-style-type: none">• Lab Coat• Stethoscope• iClickers

Learning Objectives

August 19, 2021

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.

September 2, 2021

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.

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.

September 16, 2021

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 21, 2021

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 18, 2021

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.

January 6, 2022

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.

February 3, 2022

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.

March 3, 2022

Equity, Diversity & Inclusion

A) Lecture Objectives

Students will:

1. Know how to interpret the findings of clinical research for underrepresented groups.
2. Know how subgroup analyses based on race and/or ethnicity may or may not provide useful information.
3. Know how diversity in the research team can improve research.
4. Know how to incorporate other ways of knowing that extend beyond the traditional western clinical trial.

Overdiagnosis

B) Lecture Objectives

Students will:

1. Understand overdiagnosis and its relationship to the concepts of over-detection, disease mongering, shifting disease definition thresholds, low-value care and diagnostic test accuracy.
2. Recognize the unique epidemiologic profile of a condition at risk of overdiagnosis.
3. Appreciate the myriad of complex drivers of overdiagnosis and consider feasible.

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Course Text(s)/Recommended Reading/Learning 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

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_9788132208310

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/hsi> - Key library site for accessing Medline, Pubmed, Dynamed

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

Evaluation and Course Requirements

AEEM 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 2nd, 2021

Quiz 2 – March 10th, 2022

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 10th, 2022 @ 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.

Calculators for MCQ exam – basic calculators are allowed.

Assessment Dates

The assessment dates provided in the Evaluation and Course Requirements may be subject to change due to circumstances beyond the MD Program's control. In the event that an assessment date must be changed notification of the change will be emailed to the student by the evaluation team and posted on OSLER. Students will be given as much notice of the assessment date change as possible.

Grading

The University of Calgary Medical Doctor Program is a Pass/Fail program. The grading system that will appear on a student's 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.)

For Pre-Clerkship - A student's final grade for the course is the sum of the separate components. It is not necessary to pass each mandatory component separately in order to pass the course.

For Clerkship - A rotation signed off as "Satisfactory with Performance Deficiencies" will appear as a credit on a student's medical school transcript.

Assignments/Projects**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) by February 10th, 2022 @ 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

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. 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.

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 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.

University of Calgary Medical School – Student Code of Conduct

<https://cumming.ucalgary.ca/mdprogram/current-students/pre-clerkship-year-1-2/student-code-conduct>

Electronic Submission of Course Work

Most assignments will be submitted via email to the Program Coordinator, UME unless otherwise stated. Assignments may be submitted in 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.

One45 Overview

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 are 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 (UME) 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 Academic Technologies at osler@ucalgary.ca

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 (ie. 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.

Clinical Core Overview (Pre-Clerkship Only)

Please refer to the Clinical Correlation Guidelines here:

<https://cumming.ucalgary.ca/mdprogram/about/governance/policies>

Course specific learning objectives for Clinical Core in the setting of this course can be found in the course document.

Clinical Correlation Rules of Conduct

Students and preceptors will not be used as patients for clinical correlation sessions. This means that students will not examine the preceptor, the preceptor will not examine the students and students will not examine one another.

UME Policies, Guidelines, Forms, & TORs

Please refer to the MD program website

<https://cumming.ucalgary.ca/mdprogram/about/governance>

Appeals

Please refer to the UME Student Evaluation: Reappraisals and Appeals for details regarding appeals

<https://cumming.ucalgary.ca/mdprogram/about/governance/policies>

If the student disagrees with the decision of the UME Student Evaluation Committee, the student may appeal that decision to the UME University Faculty Appeals Committee. Please refer to the [CSM UME Academic Assessment and Graded Term Work Procedures](#) for procedure for appeals.

<https://cumming.ucalgary.ca/mdprogram/about/governance>

Academic Accommodation

Students needing an accommodation because of a disability or medical condition should contact Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities available at <https://www.ucalgary.ca/legal-services/university-policies-procedures/accommodation-students-disabilities-procedure>.

Student Accessibility Services, please contact their office at (403) 220-8237, visit: MacEwan Student Centre room 452 or email: access@ucalgary.ca. Students who have not registered with the Student Accessibility Services are not eligible for formal academic accommodation.

Accommodations on Protected Grounds Other Than Disability

Students who require an accommodation in relation to their coursework or to fulfil requirements for a graduate degree, based on a protected ground other than disability, should communicate this need, preferably in writing, to the appropriate Assistant or Associate Dean

Students who require an accommodation unrelated to their coursework, based on a protected ground other than disability, should communicate this need, preferably in writing, to the Vice-Provost (Student Experience).

For additional information on support services and accommodations for students with disabilities, visit <https://live-ucalgary.ucalgary.ca/student-services/access>

Academic Integrity

The University of Calgary is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect.

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 academic integrity in the University Calendar (<https://www.ucalgary.ca/pubs/calendar/current/k-3.html>) and are reminded that plagiarism is an extremely serious academic offence.

Student Misconduct

A single offence of cheating, plagiarism, or other academic misconduct, on term work, tests, or final examinations, etc., may lead to disciplinary probation or a student's suspension or expulsion from the faculty by the Dean, if it is determined that the offence warrants such action. A student is defined as any person registered at the University for credit or non-credit courses.

Freedom of Information and Protection of Privacy

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.

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/evac-drills-assembly-points/assembly-points>

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

Internet and electronic device information and responsible use:

Students are welcome to use laptops and other electronic note-taking devices in this course unless otherwise stated. Please be considerate of others when using these devices.

Supports for student learning, success, and safety

Student Advising and Wellness (SAW): <https://cumming.ucalgary.ca/mdprogram/current-students/student-advising-wellness>

AMA Physician and Family Support Program:
<https://www.albertadoctors.org/services/physicians/pfsp>

Student Union Wellness Centre: <https://www.ucalgary.ca/wellnesscentre/>

Safewalk: <http://www.ucalgary.ca/security/safewalk>

Campus security - call (403) 220-5333

Student Success Centre: <https://www.ucalgary.ca/ssc/>

Library Resources: <http://library.ucalgary.ca/>

Student Union (<https://www.su.ucalgary.ca/about/who-we-are/elected-officials/>) or Graduate Student's Association (<https://gsa.ucalgary.ca/about-the-gsa/gsa-executive-board/>) representative contact information

Student Ombudsman: <http://www.ucalgary.ca/ombuds/role>

Copyright

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright (<https://www.ucalgary.ca/legal-services/university-policies-procedures/acceptable-use-material-protected-copyright-policy>) and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorized sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Policy.

Wellness and Mental Health Resources

The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness, and academic success, and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the excellent mental health resources available throughout the University community such as counselling, self-help resources, peer support, or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, <https://www.ucalgary.ca/wellnesscentre/services/mental-health-services>) and the Campus Mental Health Strategy website (<http://www.ucalgary.ca/mentalhealth>).

Research Ethics

If a student is interested in undertaking an assignment that will involve collecting information from members of the public, he or she should speak with the Assistant Dean, Research (UME) and consult the CHREB ethics website (<https://ucalgary.ca/research/researchers/ethics-compliance/chreb>) before beginning the assignment.

ATSSL Guidelines

Please refer to the ATSSL Web Lab PPE Requirement:

<http://www.ucalgary.ca/mdprogram/about-us/ume-policies-guidelines-forms-terms-reference>

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

Unit	Leader and Email Address
Course Chair	Fariba Aghajafari: fariba.aghajafari@ucalgary.ca
Evaluation Coordinator	TBD
Program Coordinator	Nicolle Begert: aebm@ucalgary.ca
Intro to Study Design	Tahara Bhate: tdbhate@gmail.com
Intro to Biostats	Jessalyn Holodinsky: jkhodi@ucalgary.ca
Diagnosis	Colin Bruce Josephson: cbjoseph@ucalgary.ca
Therapy	Jeffrey P Schaefer: jpschaef@ucalgary.ca
Prognosis and Overdiagnosis	Eddy Lang: eddy.lang@albertahealthservices.ca
Systematic Reviews	Fariba Aghajafari: fariba.aghajafari@ucalgary.ca
Guidelines	Doreen Rabi: Doreen.Rabi@albertahealthservices.ca
Equity, Diversity & Inclusion	Sofia Ahmed: Sofia.Ahmed@albertahealthservices.ca
Information Literacy	Diane Lorenzetti: dllorenz@ucalgary.ca