

# RESEARCH

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The graduating medical student will have developed effective learning strategies that include the capacity to engage in reflection and self-assessment, the ability to critically evaluate information and its sources (the literature), and the ability to contribute to the process of knowledge creation (research). As scholars, physicians demonstrate a lifelong commitment to reflective learning as well as the creation, dissemination, application and translation of medical knowledge.

The program objectives for the professional competency are as follows:

The competent medical graduate:

- Recognizes knowledge gaps and can ask focused questions which can address these gaps appropriately
- Retrieves medical information efficiently and effectively
- Critically evaluates the validity and applicability of medical procedures and therapeutics modalities to patient care using knowledge of research and statistical methodology
- Adopts rigorous research methodology and scientific inquiry procedures
- Prepares and disseminates new medical information
- Develops, monitors and adjusts learning

## Research Curriculum

### MEDS 112 PF: Critical Appraisal Research & Learning (CARL)

The Critical Appraisal, Research and Learning (CARL) course is completed by all medical students as a component of the Professional Foundations curriculum offered in the fall of their first year. The course encompasses 6 themes including:

1. Medical information literacy (searching and filtering reliable medical information),
2. Diagnostic tests and their properties,
3. Research designs and methods,
4. Understanding the results of medical research,
5. Critical appraisal of medical literature,
6. Key learning strategies to foster effective educational and professional learning.

These themes are addressed with didactic and small group learning exercises, online modules and textbook readings.

### Expanded CARL

The skills learned in the CARL course continue to be applied by all students throughout their subsequent pre-clerkship and clerkship courses through planned critical appraisal group work activities in which students appraise selected topical articles pertaining to their current coursework. In small groups, students complete an appraisal assignment for each article and participate in a class discussion facilitated jointly by the CARL professors. This longitudinal approach to critical appraisal ensures that students finish medical school having practiced and applied the skills that they learned in term 1 in multiple different contexts before entering residency. There are currently structured applied critical appraisal activities as components of the hematology, geriatrics, pediatrics, musculoskeletal, cardiovascular, respiratory, endocrinology, genitourinary and neurology courses.

### MEDS 232 PF: Critical Enquiry

This mandatory 2nd year undergraduate medical course guides students through the fundamental steps in the creation of a research proposal, through monthly small group learning and a series of progressive structured assignments. Students are assigned to topic focused research groups through a ranking process. They are mentored in a 3:1 student: faculty ratio by either active clinician scientists or faculty with epidemiologic and research expertise.

Monthly lectures deliver structured content relevant to the research development process, and completion of an online research ethics module is an additional mandatory component of the course. In addition, students are instructed on techniques for systematic literature review and are expected to produce an annotated bibliography for their topic of investigation. They also generate a research question with justification midway through the course. The course culminates in the submission of a full research proposal.

Course deadlines are structured to complement funded summer student research grant deadlines, so that students who choose to carry their developed proposals out may compete for funding support. Students who successfully complete this course have demonstrated competence in the development and creation of a research proposal falling within one of the four pillars of the Canadian Institutes of Health Research: biomedical, clinical, health systems and services and population and public health.



## Extra-Curricular Research Opportunities

### Student Research Opportunities

In addition to the research opportunities offered in continuation of the Critical Enquiry course, many Queen's medical students participate in extra-curricular research projects at Queen's and outside institutions. Participation in extra-curricular research provides students with self-directed opportunities to enrich their scholarly training and apply the skills they have learned through the formal curriculum. This may come in the form of a summer research project, projects completed in student's free time during the school year, or in the form of a research elective during clerkship. Interested students are encouraged to contact potential supervisors independently and follow the announcements page for project postings.

### Summer Studentships

Summer studentships are funding opportunities to allow students to pursue an original research project during the summer after first or second year. Awards are granted by the Awards Committee on the basis of academic achievement and detail and development of the project. Students are required to arrange a research project with a researcher and submit a proposal to be assessed by the committee. If students wish to pursue the research plan outlined in their Critical Enquiry project, summer studentships offer a funded opportunity to do so.

Please see the Summer Studentship website (<https://meds.queensu.ca/academics/undergraduate/research-opportunities/ugme-summer-research-studentships/school-medicine/>) for additional details.

### Scholarships and Awards

A variety of awards and scholarships are available to allow students to participate in scholarly activities such as conference attendance or research abroad.

Please see the official Awards website (<https://www.queensu.ca/studentawards/award-list/automatic-awards/upper-year-awards/school-medicine/>) for more details.

### Conferences

Queen's medical students are also encouraged to submit their research to local and international conferences in their field of enquiry. Funding is available to encourage such activities through the Dean's Office.

Additionally, Queen's School of Medicine hosts an Annual Medical Student Research Showcase. This event provides an opportunity for medical students engaged in summer

research activities to showcase their work in the form of a poster presentation. Additionally, up to three exemplary projects are selected to deliver an oral plenary presentation. Students selected for the oral plenary, along with the top student poster presenter, will jointly receive the Albert Clark Award for Medical Student Research Excellence.

### Student Initiatives

The scholar competency student leads offer a number of initiatives to students in pre-clerkship to encourage extra-curricular participation in scholarly activity. This includes a bi-weekly Journal Club in which interested students select, critically appraise and present an article from the current medical literature. The Journal Club is frequently facilitated by faculty members and provides an opportunity to extend and apply the critical appraisal skills learned through the CARL course.

Students also host several sessions to interact with clinician scientists in both formal and informal settings. In the Academic Medicine Information Session, a panel of clinician scientists is assembled to talk about careers in academic medicine and field questions from students interested in pursuing research as a career. Additionally, several Grad Club mixers are facilitated each year, allowing students to interact directly with clinician scientists.