AAMC

Curriculum Inventory in Context

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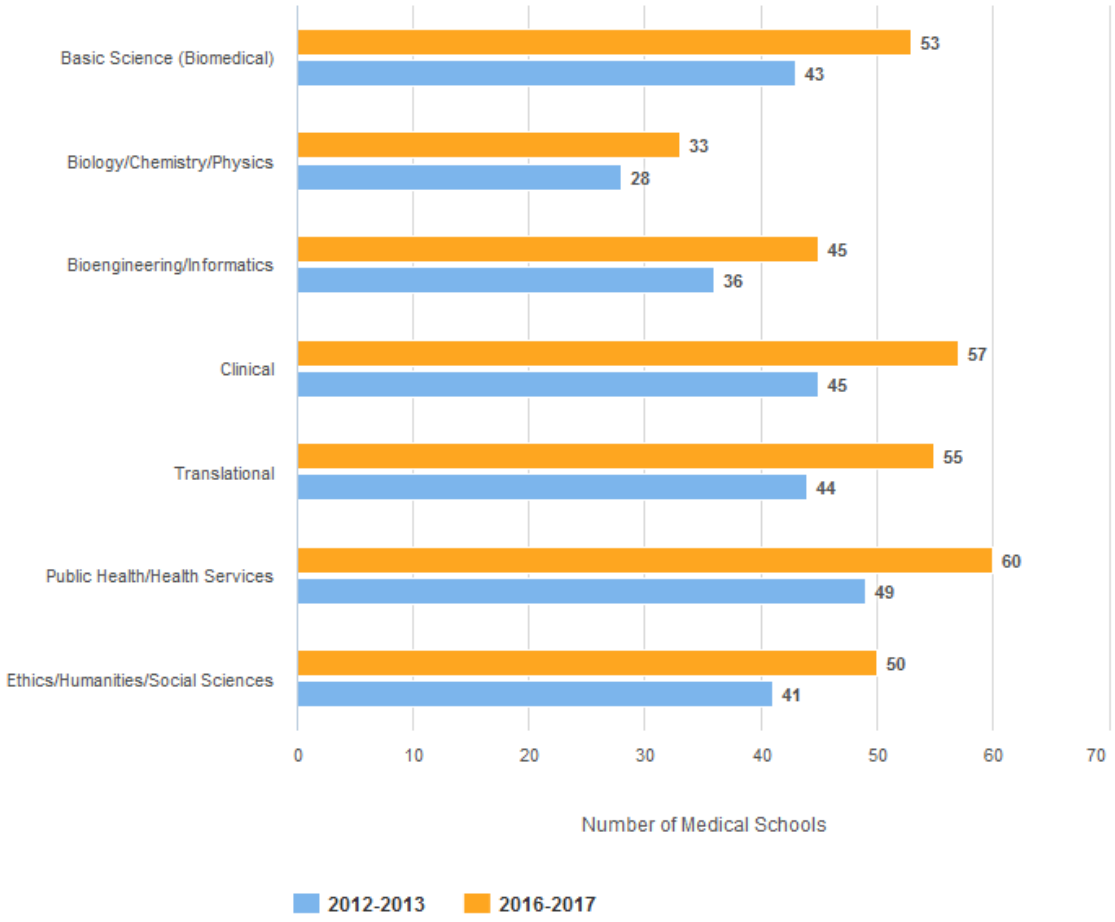
Medical Student Research in the Contemporary Medical School Curriculum

Since the Flexner Report in 1910, a major tenet of medical education is that it be based on scientific inquiry and discovery.[1] The importance of training in this area is demonstrated by Liaison Committee on Medical Education (LCME) Standard 3.2, which requires that "a medical education program is conducted in an environment that fosters the intellectual challenge and spirit of inquiry appropriate to a community of scholars and provides sufficient opportunities, encouragement, and support for medical student participation in the research and other scholarly activities of its faculty."[2] Over the last century, the importance of inquiry and discovery has been broadened from the science of medicine to also include the social and economic aspects of medicine. By performing research and scholarly activity in these areas, students gain valuable analytical and critical thinking skills, facilitating their ability to integrate inquiry and discovery to improve patient care throughout their medical careers. Further, for learners interested in a career in academic medicine, as well as for learners interested in entry into a competitive field such as surgery or orthopedics, research experience is vital.[3,4]

Scholarly research can cultivate a passion to be at the forefront of discovery and can be pivotal to igniting a student's commitment to an academic career. Data from the LCME's Annual Medical School Questionnaire Part II from 2012-2013 and 2016-2017 show that medical schools provide research opportunities in a broad number of fields (Figure 1). For example, Albany Medical College (AMC) provides research opportunities in areas that encompass a wide variety of scholarly concentrations, including biomedical sciences, clinical research, health care administration, community service, bioethics, and patient advocacy. Thus, research and scholarly activity in the sciences, economics, and social aspects of medicine are a critical part of medical student education.

Figure 1. Medical Student Research Requirement: Types of Research[a]



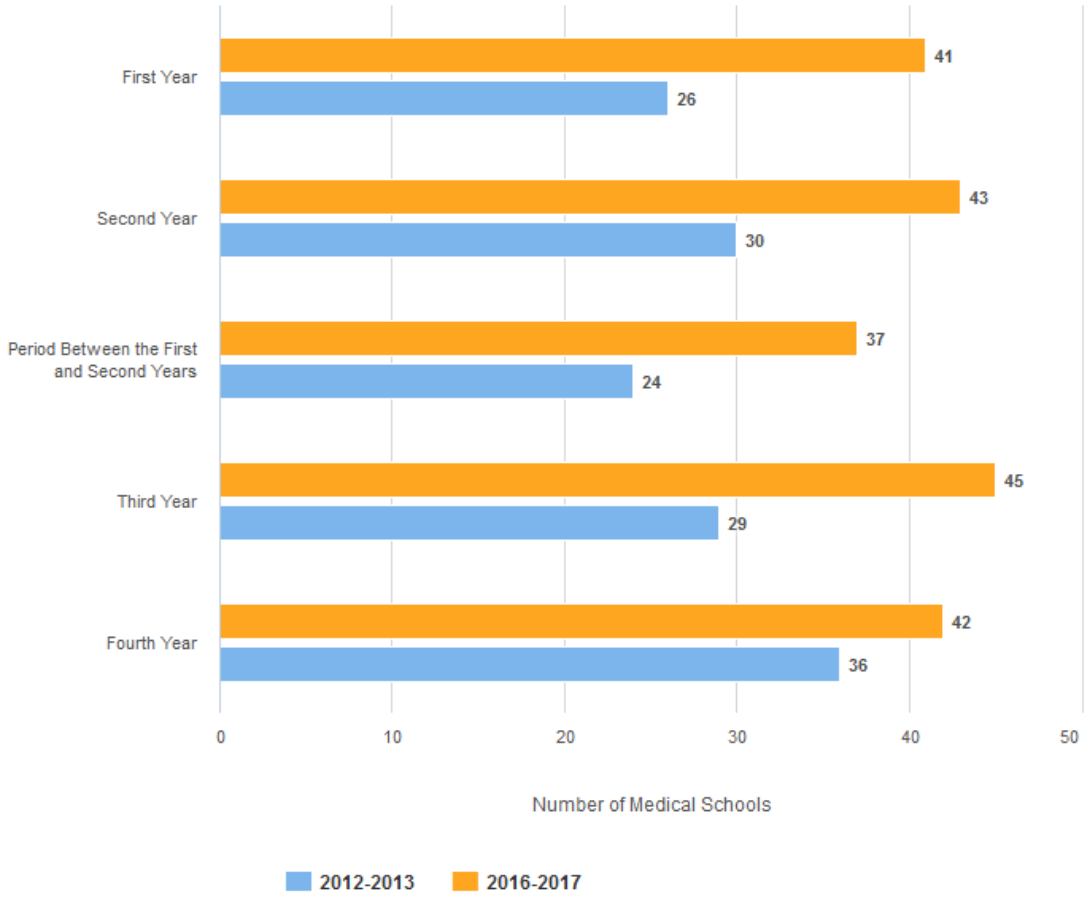
Survey Item: Indicate what types of research are permitted to fulfill the research requirement.
In 2012-2013:
A total of **49** medical schools have a research requirement for medical students.
A total of **49** medical schools responded to the survey item by indicating the types of research permitted to fulfill the research requirement.
A total of **136** medical schools participated in the survey.
In 2016-2017:
A total of **62** medical schools have a research requirement for medical students.
A total of **62** medical schools responded to the survey item by indicating the types of research permitted to fulfill the research requirement.
A total of **145** medical schools participated in the survey.
Source: LCME Annual Medical School Questionnaire Part II, 2012-2013 and 2016-2017.

[a]Figure 1 includes 2012-2013 and 2016-2017, the 2 school years when the LCME Annual Medical School Questionnaire Part II collected data about this survey item.

Given the importance of research to medical education, the question has been raised whether research should be a requirement in the medical school curriculum. Data from the LCME

Annual Medical School Questionnaire Part II for 2012-2013 show that 36% (49 of 136) of reporting institutions had a research requirement as part of their curriculum in 2012-2013. This proportion increased to 43% (62 of 145) by 2016-2017 (Figure 2). Providing students with a wide variety of research options, such as the ones shown in Figure 1, will ensure a research requirement enhances learner education rather than burdening it. Alternatively, an institution may be able to increase participation in research without making research a requirement by encouraging faculty to both demonstrate the importance of research and help facilitate scholarly opportunities for students. AMC has combined MD/PhD programs, which are 7-8 years long and have a research requirement. The students who enter the traditional MD track do not have a research requirement; however, AMC's goal is to encourage the traditional track students to perform research by exposing them to research done by students in the combined degree program. This starts with informing traditional track students about research opportunities during first-year orientation and continues by providing information through an ongoing series of informational sessions labeled Common Questions About Research, as well as via regular postings from the Office of Research Administration and advising deans. In addition, first-year students are exposed to research performed at AMC by attending Medical Student Investigation (MSI) Day. MSI Day gives students who have performed research or scholarly activity a forum at which to present their findings to the faculty, staff, and medical student body in the form of a poster presentation. Preparatory training for MSI Day includes a workshop on abstract preparation, poster development, and presentation, all of which are parts of a process designed to equip students for presentation at regional and national levels. Not only does MSI Day enrich the academic environment at AMC, it also allows incoming first-year students to see the research performed by their AMC peers. To ensure the engagement of all students, those who have not performed a research project of their own must complete a detailed assessment of two or more scholarly projects presented at the poster session. The emphasis on research at AMC has helped cultivate student interest in undertaking research and scholarly activity, as demonstrated by three-fourths of the graduating class of 2017 having performed some type of research project.

Figure 2. Medical Student Research Requirement: Curriculum Year



Survey Item: Indicate in what years of the curriculum students actively engage in their research project.

In 2012-2013:

A total of **49** medical schools have a research requirement for medical students.

A total of **49** medical schools responded to the survey item by indicating the years of the curriculum where students actively engage in their research project.

A total of **136** medical schools participated in the survey.

In 2016-2017:

A total of **62** medical schools have a research requirement for medical students.

A total of **62** medical schools responded to the survey item by indicating the years of the curriculum where students actively engage in their research project.

A total of **145** medical schools participated in the survey.

Source: LCME Annual Medical School Questionnaire Part II, 2012-2013 and 2016-2017.

[a]Figure 2 includes 2012-2013 and 2016-2017, the 2 school years when the LCME Annual Medical School Questionnaire Part II collected data about this survey item.

Time is very constrained in most medical school curricula due to the need to offer comprehensive training in the many competencies and skill areas required to be a physician.

Despite this time crunch, data from the LCME Annual Medical School Questionnaire Part II show that research is performed evenly across all 4 years of medical school, including during the period between a learner's first and second years (Figure 2). This is also true at AMC, with approximately one-third of AMC's first-year students dedicating the 8 weeks between the first and second years of medical school to engaging deeply in full-time research at a laboratory or clinical site. To promote student research during this time, AMC has developed a summer research fellowship coordinated by the Office of Graduate Studies. A faculty committee selects students to receive this fellowship based on the merit of each student's submitted research proposal, and awardees are supported by stipends.

Although time is a valuable commodity in the medical school curriculum, some students become deeply committed to their projects and look for a way to take their research to the next level. AMC has developed a Medical Doctor with Distinction in Research (MDDR) program to fulfill this need. In the MDDR program, students are guided by a mentor in the track of their choice to develop knowledge and required skills. Students choose from five tracks: research (whether discovery [basic science] or clinical sciences), service, health systems analysis, bioethics, or advocacy. Each of these MDDR tracks consists of a curriculum that includes a longitudinal study with mentored guidance, beginning with a written proposal and supervised by a Thesis Advisory Committee that is unique for each student. The project involves several weeks of field, clinical, analytical, or laboratory work and includes a mandatory presentation of outcomes at MSI Day. Students are also encouraged to present outcomes at additional local, regional, and/or national venues. Projects culminate with an oral presentation open to the academic community and the defense of a thesis document before the Thesis Advisory Committee. Ideally, students also submit a manuscript based on their research to a peer-reviewed journal to be considered for publication. Students who wish to pursue a distinction complete all components of the distinction tracks within the 4 years allotted for medical school at no extra tuition cost. On average, approximately 6% of AMC students graduate with the designation of distinction each year. In addition to honing students' inquiry skills, earning this

designation enhances students' portfolios when applying for residency and other professional accolades.

Performing research or scholarly activity during undergraduate medical education develops skill sets that other aspects of the medical school curriculum may not foster. As well as enhancing students' learning during medical school, research experience or scholarly activity provides them with valuable analytical and critical thinking skills they can utilize throughout their careers. In alignment with the ever-increasing emphasis on evidence-based medicine, these skills allow students to experience research methods firsthand and foster deeper appreciation of the evidence-based medicine curriculum. For many schools, the addition of a research requirement to the medical school curriculum is a reflection of a stated goal to increase the number of medical students who choose to become physician scientists.[5,6] This is an important goal, given the observed shortage of academic physicians and physician scientists.[7-9] Developing school-based and national[9] programs that expose medical students to research and scholarly activity early in medical school and encourage them to participate is vital to increasing student participation. Continued monitoring of the integration of research and scholarly activity at medical schools by the LCME, such as through collection of the survey data discussed in this *Curriculum Inventory in Context,* is also a critical part of this process.

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