

## The current state of medical informatics curricula in undergraduate medical education: A national survey

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### Abstract

**INTRODUCTION:** Medical informatics (MI) is a science focused on improving the digital delivery of healthcare services. With the advent of electronic health records (EHR) and its integration in medicine, students are expected to acquire a newer form of non-medical skills while learning fundamental medical knowledge and clinical decision-making.

Unlike the Accreditation Council for Graduate Medical Education (ACGME) fellowship-level training in clinical informatics, the Association of American Medical Colleges (AAMC) has not set competency expectations for medical informatics in undergraduate medical education. The American Health Informatics Management Association (AHIMA) has suggested five areas that professional medical education should address: literacy and skills, computer literacy, electronic health records, privacy and confidentiality, information and data technical aspects, and security.

**PURPOSE:** The primary goal of this study was to describe the current state of integration of MI in curricula across medical schools in the United States. The secondary goal was to identify how the five areas recommended by the AHIMA are being fostered.

**METHODS:** This is an IRB-approved cross-sectional national survey conducted between January and April 2022. The survey consisted of open- and close-ended questions focused on the presence of current medical informatics platforms, interest, integration, and perceived utility in current medical school training. Associate deans of medical education and/or curricula and those involved in curricular development at all 192 US-based allopathic and osteopathic medical schools were contacted electronically.

**RESULTS:** The response rate was 40% (77 out of 192). Up to 50% of respondents reported formal integration of medical informatics in their UME curricula, with 67% defining it as a course that is set up with defined objectives. The material offered was structured as electives available to the students (67%), integrated into existing required courses (23%), and as stand-alone required courses (10%); however, only 20% reported seamless integration into the curriculum. Regarding format, this was mainly in-person lectures (63%) compared to online modules (27%).

Although 61% of all participants reported initiating a form of learner exposure in the preclinical years, 48% of participants acknowledged knowing of student-reported concerns regarding readiness for managing EHR by the expected graduation date. Current setups include 24% of participants suggesting gradual unstructured training limited to preclinical years, while

15% suggested dedicated sessions and modules during that period. However, 11% reported having set up modules for MI education scheduled immediately prior to switching into the clinical part of the curriculum.

Up to 51% of the study participants reported five or more years of experience in medical education. Most respondents were from the Midwest (29%) and Mid-Atlantic (25%). Similarly, the most common age groups were the ages of 35-44 (at 31%) and 45-54 (at 30%).

Of those engaged in teaching MI, 37% were informatics-credentialed faculty, 27% had supplementary training permitting informatics mentoring, and the rest were medical librarians. However, only 30% reported MI education having been set up in an interprofessional manner. When asked who should ideally teach MI, 63% suggested that physicians with informatics training should lead the tutelage, whereas the rest suggested that CMIOs, medical librarians, or other informatics trained personnel could teach the students. Limitations prohibiting having the ideal educators teach such courses include the lack of perceived importance of the topic by leadership and faculty (33%), time constraints (22%), financial challenges (16%), recruitment interest (15%), with 14% being left unspecified.

The topics taught most commonly include clinical decision making (46%), literature searching (24%), EHR use (23%), and security and ethics in healthcare (19%). However, students most commonly utilize informatics skills to focus on EHR handling (66%) and literature searches (66%) compared to patient education (43%) and telehealth services (43%).

**CONCLUSION:** Medical informatics curricula lack uniform application and cohesiveness across medical schools. Students may benefit long-term from structured training and competencies set up by educational regulatory bodies in order to address the five areas recommended by the AHIMA.