Report of the AAHSL
AAMC/IIME Report Response Task Force (aka the GEA Task Force)

Submitted to the AAHSL Board
October 15, 2007

Julia Sollenberger, Chair
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Note to the AAHSL Board

The AAHSL GEA Task Force recommends that portions of this report be presented to the potential collaborators mentioned in the report – the GEA (and LiME groups), GIR, and AMIA. Following Board review and discussion, a somewhat modified Executive Summary (some background sections removed, but with fuller explanation of the specific recommendations) could be sent to the leaders of these groups, along with possible next steps.

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EXECUTIVE SUMMARY

Introduction and Background

In the spring of 2007 the AAMC/IIME Report Response Task Force (aka the GEA Task Force) was appointed to develop a response to the work of AAMC's Institute for Improving Medical Education. (See Task Force Charge, Appendix 1.) The report, to be submitted to the AAHSL Board by October 30, 2007, was to reflect the commitment and expertise of AAHSL and its members to make a difference in the education of health students and professionals throughout the continuum of their education and careers.

AAHSL has expressed a desire to become more closely associated with AAMC's GEA (Group on Educational Affairs), one of several professional development groups in the AAMC whose mission is to promote excellence in the education of physicians throughout their careers. Since AAHSL and the GEA share many of the same goals and concerns related to education across the continuum, a more "official" relationship could be advantageous to both groups. As the Task Force has recommended projects that respond to the two AAMC reports, we have been especially cognizant of the association's desire to partner with the GEA and to strengthen this relationship. At the same time, we realize that AAHSL libraries function within the broader context of academic health centers, interacting with a variety of health professions and supporting a range of health education curricula. Throughout our recommendations we open the door to exploring similar relationships with other health professions education groups. Initially, this can be accomplished by partnering with umbrella organizations such as AAHC (Association of Academic Health Centers).

Process and Findings

The task force began by studying the two reports (access both from http://www.aamc.org/meded/iime/start.htm):

- *Educating Doctors to Provide High Quality Medical Care: A Vision for Medical Education in the United States*, Commissioned for the AAMC Institute for Improving Medical Education, July 2004 (the "IIME Report")
- *Implementing the Vision: Group on Educational Affairs Responds to the IIME Dean's Committee Report*, September 2006 (the "GEA Report")

The first report (the IIME report) identified key strategies for affecting reform to achieve the "Ideal Medical Education System". Within each key strategy are suggestions to each constituency to redesign their programs or refocus their activities to emphasize actions that would: 1) bring about a patient-centered approach to medical care; 2) ensure that doctors are capable of providing high quality medical care; 3) improve the efficiency of the educational process; and 4) improve the effectiveness of the educational process. The second report on "implementing the vision" (the GEA Report) details some areas of research and investigation that would stimulate and justify these basic reforms. They are categorized within the four areas of concern listed in the IIME report.

Many of the recommendations in the two AAMC reports include developing skills in effective use of evidence for clinical decision-making, as well as skills in information technologies for learning and improved patient care. In both of these domains, libraries have already become effective partners locally, and across the continuum of the educational system -- to clarify the skills needed, to effectively teach those skills, and to ensure constant renewal of those skills

given the rapid pace of change and the availability of new resources and tools. Our Task Force report analyzes these areas of mutual concern between librarians and health educators and suggests some examples of collaborative work that could not only provide deeper insight into creating new programs, but illustrate the very principle of the benefits of interdisciplinary team approaches to 21st century problems. It is clear that library and knowledge management issues cross the continuum of health professions education – undergraduate, graduate, continuing, and research – and that many recommendations within the reports resonate with concerns and goals of our member libraries.

Below is a chart listing the four elements of the ideal medical education system (from the IIME report) and key areas of mutual interest with AAHSL libraries.

Chart 1

Ideal Medical Education System Vision	Key Concern and Library Linkages
1) Promote patient centered approach to medical care.	Patient experiences need to occur early and as an interdisciplinary experience. AHC libraries have extensive programs to provide health information to patients and consumers, both internal in patient libraries and externally in community based healthy information outreach programs.
2) Ensure that doctors are capable of providing high quality medical care.	Expand the ACGME Core Competencies into a longitudinal approach to all medical education. Develop assessment capability for the competencies at every level. All academic health science libraries are concerned with ensuring that their constituents have access to and use established and evolving medical knowledge appropriately in treating patients. This includes ensuring both opportunity and skills for life-long learning, critical appraisal, and knowledge management for the best evidence.
3) Improve the efficiency of the educational process.	The articulated competencies transcend traditional discipline and departmental boundaries, as well as through a variety of institutional oversight from a longitudinal perspective. Integration and centralized curriculum management are desirable. Health sciences librarians work with users at all levels of the medical learning continuum, including pre-med and high school programs. Also, due to the nature of our knowledge domain (skills) we have experimented with new models for teaching at the point of need/care and for different user levels and using distance learning.
4) Improve the effectiveness of the educational process.	Programs for faculty development, including rewards and recognition are important to emphasize the value of educators, and maximize training opportunities. As faculty and teaching colleagues in academic health centers, librarians are concerned with both providing faculty development to clinical faculty in use of evidence-based medicine tools and information management skills.

Following our analysis of the two reports, Task Force members met with the GEA (Group on Education Affairs) representatives (for UME, GME, CME and research) from our respective institutions to discuss their thoughts on possible partnerships and collaborations with librarians. Task Force members also attended the LiME (Libraries in Medical Education) gathering at the MLA '07 Annual Meeting in Philadelphia. LiME groups are special interest groups (SIGs) within the Group on Educational Affairs (GEA) regions. GEA does much of its work at the regional level, and regional LiME groups have either already formed, or are beginning to convene, in all of the four GEA regions: Central, Southern, Northeast, and Western. The AAHSL GEA Task Force made a decision to work in collaboration with the LiME groups so that we would not overlap in purpose or execution. The Task Force met at MLA '07 in Philadelphia, and then again in four separate conference calls. We agreed on the set of recommendations to include in the report, with individuals working on the separate report sections.

The central theme of all of our meetings with institutional GEA representatives was widespread interest in extending to all segments of medical education a focus on the professional competencies developed and implemented by the Accreditation Council for Graduate Medical Education. The ACGME core competencies are beginning to be used across the continuum – in undergraduate, graduate, and continuing medical education. Institutions and licensing bodies alike are beginning to recognize that excellence in clinical practice requires not only competency in patient care and medical knowledge, but also in communication, professionalism, practice-based learning and improvement, and systems-based practice. The "practice-based learning and improvement" core competency implies that a physician will be able to critically analyze the medical literature and confidently practice evidence-based medicine at every level of his/her professional career. This theme has pervaded our discussions and is evident in our recommendations.

Recommendations

1. Work in partnership with other organizations (Regional LiME groups, GEA, AMIA, GIR) to improve the quality of medical education across the continuum, specifically with regard to the discovery, appraisal, and assimilation of knowledge-based information and scientific evidence for the delivery of high-quality, patient-centered care. Develop a unified approach, addressing the following activities of evidence-based medicine teaching and learning that cross the learning continuum:
    1.1 assess learning needs
    1.2 determine competencies
    1.3 develop and deliver self-paced, interactive instruction
    1.4 assess achievement of competencies

2. Work in partnership with GEA (including LiME groups) on the literature searching portion of the Medical Education Research Certificate (MERC). Co-develop and co-teach, with medical educators, the face-to-face sessions, and collaborate on the development of web-based learning modules.

3. Conduct collaborative research that addresses the research priorities outlined in the IIME and GEA Reports.

4. With AMIA, GEA, and/or GIR, develop a review article on the current state of integration of evidence-based information into the Electronic Health Record.

Timing Considerations

Several of the Task Force Recommendations are general in nature and will require a strategic approach. A few are specific and can be addressed with more immediate and practical tactics. It seems that Recommendations 2 and 4, being the most specific, should be given top priority. Recommendation 2, related to the MERC curriculum, could become the first priority of an Online Learning Task Force (suggested in Recommendation 1.3). Recommendation 1.2 – determining competencies – should also receive some immediate attention; we want to take advantage of the interest of the GIR in collaborating on this initiative. Recommendation 1.4, assessment of competency achievement, would be the last recommendation to be addressed.

Other Task Force Accomplishments

The Task Force has been in contact with the LiME groups of GEA since before the MLA meeting in Philadelphia (see paragraph on LiME interactions in "Process and Findings" section of this Executive Summary). Since then we have collaborated on a joint poster to be presented at the AAMC IME (Innovations in Medical Education) Exhibit. (The abstract for this poster is in Appendix 2 of this report.) The poster is entitled "Balancing the Scales with Quality Health Information: An Emerging Alliance among AAHSL (Association of Academic Health Science Libraries), LiME (Librarians in Medical Education), and GEA (Group on Educational Affairs). The paper poster includes: (1) a map of the United States indicating locations of institutions with interested LiME librarians; (2) a list of areas of mutual interest between medical educators and librarians; and (3) an abbreviated list of these recommendations. There is also an interactive poster that makes use of Google My Maps and Google Earth to map out these locations, with pop-up details that include institutional contact names and locations.

Lauren Maggio (Northeast GEA LiME chair) and Erika Sevetson (Central GEA LiME member) collaborated with Julia Sollenberger to develop the poster. Lauren, Erika, and Julia have also been in contact with librarians in the Western and Southern GEA's to encourage grassroots efforts to organize and form Regional GEA LiME groups in those regions. Some progress has been made toward that end.

SPECIFIC RECOMMENDATIONS

Recommendation 1.

Work in partnership with other organizations (Regional LiME groups, GEA, AMIA, GIR) to improve the quality of medical education across the continuum, specifically with regard to the discovery, appraisal, and assimilation of knowledge-based information and scientific evidence for the delivery of high-quality, patient-centered care. Develop a unified approach, addressing the following activities of evidence-based medicine teaching and learning that cross the learning continuum:

- **1.1 assess learning needs**
- **1.2 determine competencies**
- **1.3 develop and deliver self-paced, interactive instruction**
- **1.4 assess achievement of competencies**

Both the IIME and GEA reports stress the importance of improving practices across the continuum of undergraduate, graduate, and continuing medical education. Underlying these recommendations and strategies for affecting reform is the assumption that there is access to high-quality information resources and trained librarians to provide support for such learning and practice.

Historically, librarians have been effective partners in the learning process by ensuring access to a broad range of information resources, by participating in the instruction of medical students, residents, and practicing physicians, and by contributing to medical education research. AAHSL can build on this history and advance toward even greater contributions to medical education by forging partnerships within the GEA and its sections and regions specific to education for successful discovery, appraisal, and assimilation of knowledge-based information and scientific evidence and incorporating this new knowledge into the delivery of high-quality, patient-centered care.

1.1 Assess learning needs

Evidence of measured learning needs is an integral step in any effective educational planning process. One medical education accrediting group, the Accrediting Committee on Continuing Medical Education (ACCME) mandates its inclusion in two essential planning elements: "Use a planning process(es) that links identified educational needs with a desired result in its provision of all CME activities", and "Use needs assessment data to plan CME activities". Assessed needs are also mandated as part of the evaluation and improvement process: "Evaluate the effectiveness of its CME activities in meeting identified educational needs". This well documented and widely utilized process can serve as a model for a needs assessment process for other parts of the medical education curriculum. The Task Force recommends that a needs assessment plan be developed for determining skill gaps in the discovery, appraisal, and assimilation of knowledge-based information and scientific evidence for the delivery of high-quality, patient-centered care. AAHSL could develop these jointly with AAMC, GIR, and GEA, across the education continuum.

AAHSL member institutions should collaborate to design and implement these model needs assessment tools and methods in the areas of information literacy, retrieval, and management.

Doing so will enable the sharing of information across institutions and provide benchmarks and comparative data needed to improve the processes used by all member institutions. Needs in this area evolve as physicians move from undergraduate to graduate to practicing professional but common curricular practices often enable similar efforts. As stated by McGowan, et. al. (see Appendix 3) the success of American medical schools to fully incorporate information related competencies as learning objectives is uneven.

Some information-management related target audience needs to be assessed include:

- ability to explain clinical decision making and the role of information in decision making;
- expertise in the use of evidence-based medicine (clinically and in teaching);
- information management skills;
- practice-based learning and improvement skills;

Instruments developed at the Ebling Library, University of Wisconsin may serve as a starting place for needs to be assessed. (Appendix 4)

Within our own institutions, librarians who are familiar not only with the literature of medical education but also skilled in effective ways of searching and retrieving relevant literature are invaluable members of an education team. Librarians can retrieve and maintain a database pertinent to the task at hand: planning and implementing effective and efficient learning needs assessments. Many librarians are involved in CME planning for their institutions and therefore are familiar with the planning steps, including needs assessment, for GME and CME. Academic medical librarians often serve as members of curriculum committees and therefore understand undergraduate medical education as well. Educational needs assessments must be accomplished across the continuum from undergraduate to continuing education, and must include those needs relating to successful lifelong learning. The Task Force encourages AAHSL librarians to participate in institutional work groups related to needs assessment

1.2 Determine competencies

In order to develop curricula on topics related to the discovery, appraisal, and assimilation of knowledge-based information and scientific evidence for the delivery of high-quality, patient-centered care, a set of competencies must be determined. Competencies guide the creation of learning objectives for instructional experiences and interventions.

Almost a decade ago AAMC developed a broad set of competencies in medical informatics – *Contemporary Issues in Medicine: Medical Informatics and Population Health, Medical School Objectives Project (MSOP), June 1998.* *(*http://www.aamc.org/meded/msop/msop2.pdf) The MSOP section which outlines "life-long-learning" objectives is most relevant to the knowledge and evidence-based skills taught by librarians, though other "information" skills are scattered throughout the remaining sections of the document. Using the MSOP competencies as its foundation, the AAHSL/GEA Task Force has developed a "Skills and Competencies Matrix" (Appendix 5) that considers at what point in the medical education continuum these competencies might

best be acquired. The matrix also correlates the MSOP competencies to the content of various professional association reports and projects such as the IIME Report, the GEA Report, and the ACGME core competencies for graduate medical education.

Several of the ACGME core competencies do include an information or evidence component to which librarians can effectively and efficiently contribute, especially in collaboration with other education-related groups. While the ACGME competencies are directed toward graduate medical education, the concepts are valid for students and practitioners alike, as well as for their counterparts in all the health professions. The competency regarding "practice-based learning and improvement" states, among other things, that residents must be able to "appraise and assimilate scientific evidence." It includes specific statements about locating and appraising evidence from scientific studies, and using information technology to manage information and access on-line medical information.

Over the years MSOP competencies have been used to varying degrees in AAMC institutions (as described by McGowan et.al., Appendix 3), but they have not been refreshed or revised since their creation. As well, many institutions are now beginning to use the ACGME competencies across the education continuum. It seems that a new competency set that is based upon the MSOP and ACGME competencies and informed by the experiences and insights of librarians, educators, and medical informaticians would be of great benefit to AAMC institutions attempting to develop educational experiences across the continuum. The Task Force therefore recommends that AAHSL collaborate with the GIR and the GEA to develop a set of competencies in informatics and information management. AAHSL would focus its attention on the discovery, appraisal, and assimilation of knowledge-based information and scientific evidence for the delivery of high-quality, patient-centered care.

1.3 Develop and deliver self-directed, interactive instruction

More than most other modes of instruction, self-directed or interactive educational modules, available without regard to time or place and that abide by adult education principles, have the potential to help physicians make a real and lasting change to their practice behavior. Many AAHSL institutions have worked on such modules for teaching library-based information management skills such as Medline searching, principles of evidence-based medicine, or the use of EBM resources. The MLAnet Core Toolbox (http://www.mlanet.org/members/toolbox/SPT--MPT_Subjects.php) contains numerous examples of these instructional modules. There are some EBM-related online education tools in MedEdPortal as well (http://www.aamc.org/mededportal).

The GEA Task Force recommends that AAHSL develop an Online Learning Task Force to investigate the development of a limited set of self-directed, interactive modules for teaching health professionals and students competencies related to practice-based learning (the relevant ACGME competency) and evidence-based medicine. Specific competencies would have to be identified that would cross the health professions education continuum and be widely applicable across institutions and professions. The Online Learning Task Force would need to determine priorities, methodologies, and next steps, as well as consider ways to keep the modules, once developed, up to date. (Note: Part of Recommendation 2 – to work with GEA to co-develop web-based learning modules that would cover the literature searching portion of the MERC – is really a more specific piece of this Recommendation 1.3.

We realize this relationship and suggest that the Online Learning Task Force's first priority might be the MERC course.)

The MedEd Portal could become the dissemination vehicle for these online modules, and also provide an opportunity for peer review.

1.4 Assess achievement of competencies

Assessing the successful achievement of evidence-based medicine competencies has received much attention in the literature, with a range of specific methods and results described. It seems there is little agreement, however, on general principles or standards for assessing the effectiveness and efficiency of finding relevant evidence for patient care decisions. For graduate medical education, at least, the ACGME's Outcome Project is working to facilitate implementation of outcomes assessment according to ACGME program requirements. Their web site (http://www.acgme.org/outcome/project/proHome.asp) has one major portion devoted to assessment, with specific sections that include key considerations for implementing assessment, a toolbox and table of assessment methods, as well as sample tools and references.

The GEA Task Force recommends that an AAHSL assessment initiative be started, but probably not until some substantive work has been completed to identify competencies and develop the online learning modules to teach those competencies. A standard way to assess the learner's attainment of skills necessary to discover, appraise, and assimilate knowledge-based information and scientific evidence for the delivery of high-quality, patient-centered care could follow if these first two steps in the EBM skills continuum are well on their way.

Recommendation 2.

Work in partnership with GEA (including LiME groups) on the literature searching portion of the Medical Education Research Certificate (MERC). Co-develop and co-teach, with medical educators, the face-to-face sessions, and collaborate on the development of web-based learning modules.

The Medical Education Research Certificate (MERC) is a GEA instructional program intended to provide the knowledge necessary to understand the purposes and processes of medical education research, to become informed consumers of the medical education research literature, and to be effective collaborators in medical education research. One of the nine workshops in the MERC series is "Searching and Evaluating the Medical Education Literature." In two of the Regional GEAs, the LiME (Librarians in Medical Education) groups have, in recent years, begun to co-teach some of these sessions.

The Task Force recommends that AAHSL and the LiME groups pursue a more formal collaboration with GEA and co-teach the workshop as part of the curriculum of the MERC program. As this workshop is held at both the AAMC Annual Meeting and at various GEA regional meetings, AAHSL and the LiME groups can work together to provide assistance as needed – to locate qualified librarian instructors who can share the responsibility of delivering the course content and monitoring the exercises. AAHSL, in collaboration with LiME librarians,

can also provide assistance in the updating and enhancing of the course materials on a regular basis. With information resources and discovery techniques changing rapidly each year, constant attention is needed to assure that this instruction continues to be of the highest quality.

The "Searching and Evaluating the Medical Education Literature" workshop is offered only once or twice a year, providing an in-person learning opportunity for fewer than 100 persons annually. In addition, while the information provided would be of great value to any medical student or practitioner, this course generally is taken only by MERC program series registrants, and not by those in other medical education circles. Perhaps a web-based course of study could be developed and offered to MERC registrants as well as others in the GEA learning community.

Development of such a module is well within the capabilities of AAHSL and its institutions. This could be developed similarly to the tutorial in responsible literature searching built by the Health Sciences Library System at the University of Pittsburgh – an online module widely used to promote the development of improved discovery skills and more responsible research conduct. AAHSL could put out a "call" for an institutional developer that would: (1) do background work, including a literature search and polling of AAHSL members; (2) coordinate a group of interested AAHSL librarians who would provide input and feedback; and (3) build one or more web-based, interactive modules. This institution would receive compensation for their coordination and development work. The Task Force recommends that AAMC be approached to provide funding for development of these online learning modules.

Recommendation 3.

Conduct collaborative research that addresses the research priorities outlined in the IIME and GEA Reports.

The IIME and GEA Reports suggest that the research interests of various groups within the health professions education continuum be brought to bear to define and explore this "Ideal Medical Education System." Below is a chart that provides examples of mutual research interest between librarians and educators within the health professions, and suggests likely partners/collaborators in exploring new research projects. (Please note: first two columns below duplicate the content provided in Chart 1, page 4.)

Chart 2.

Ideal Medical Education System Vision	Key Concerns and Library Linkages	Relevant Library programs and concerns	Possible Research Partners
1) Promote patient centered approach to medical care	Patient experiences need to occur early and as an interdisciplinary experience. AHC libraries have extensive programs to provide health information to patients and consumers, both internal in patient libraries and externally in community based healthy information outreach programs	Libraries and medical educators can provide particular experiences for students in understanding how and why patients seek medical information for their own needs. This could help with patient/physician communication training. Some questions for outcomes studies would be whether improved health information and health literacy improves physician communication and treatment effectiveness; does easy access to health information make a difference in patient attitudes, does physician referral to patient information make a difference in treatment outcomes, how do physician attitudes toward patients asking questions affect outcomes, etc.	Medical School Curriculum officers, Hospital Administrators, Nursing/Patient Educators, Community organizations, Residency Directors, Physician professional societies, AAMC units.
2) Ensure that doctors are capable of providing high quality medical care	Expand the ACGME Core Competencies into a longitudinal approach to all medical education. Develop assessment capability for the competencies at every level. All academic health science libraries are concerned with ensuring that their constituents have access to and use established and evolving medical knowledge appropriately in treating patients. This includes ensuring both opportunity and skills for life-long learning, critical appraisal, and knowledge management for the best evidence.	As tools and resources for discovering and efficiently using best evidence proliferate and change, it is critical that these are life long skill sets and continuously evaluated. We are especially interested in linking the appropriate use or absence of these skills to patient outcome measures. How does integration of these tools with the EMR affect physician decision making and patient outcomes, how do physicians continue to keep abreast of changes in evidence-based medicine once in practice and out of the academic continuum, how can these skills best be taught through integration in the curriculum?	Directors of undergraduate, residency and continuing medical education, professional accrediting bodies and their boards, AAMC units

Ideal Medical Education System Vision	Key Concerns and Library Linkages	Relevant Library programs and concerns	Possible Research Partners
3) Improve the efficiency of the educational process	The articulated competencies transcend traditional discipline and departmental boundaries, as well as through a variety of institutional oversight from a longitudinal perspective. Integration and centralized curriculum management are desirable. Health sciences librarians work with users at all levels of the medical learning continuum, including pre-med and high school programs. Also, due to the nature of our knowledge domain (skills) we have experimented with new models for teaching at the point of need/care and for different user levels and using distance learning.	We are interested in the most appropriate and effective teaching/learning methodologies for the variety of situations that medical education will be developing. We seek partners in developing and evaluating these models to find best practices. We also seek to implement national use of these models in hopes of providing the best educational options for the whole system.	Directors of undergraduate, residency and continuing medical education, professional accrediting bodies and their boards, AAMC units
4) Improve the effectiveness of the educational process	Programs for faculty development, including rewards and recognition are important to emphasize the value of educators, and maximize training opportunities. As faculty and teaching colleagues in academic health centers, librarians are concerned with both providing faculty development to clinical faculty in use of evidence-based medicine tools and information management skills.	Librarians are also desirous of increasing our pedagogical skills and knowledge sets. We seek partners in evaluating our own skill sets and in increasing those of the faculty around us.	Medical school deans, directors of undergraduate, residency and continuing medical education, AAMC units.

In summary, it is clear that AAHSL agrees with the issues brought to the fore in the AAMC reports and would welcome the opportunity to engage in joint research efforts with the RIME, the UGME, the GME and the GEA sections of the AAMC, to begin to implement the vision of the Ad Hoc Deans Committee. The Task Force recommends that:

- the AAHSL Board considers moving forward with this concept of joint research and begins to prioritize the projects and partners.
- a survey of the AAHSL membership be conducted to identify collaborative research already underway within our institutions
- a Research Task Force be formed to develop plans to conduct collaborative research in at least one high priority area

Recommendation 4.

With AMIA, GEA and/or GIR, develop a review article on the current state of integration of evidence-based information into the Electronic Health Record (EHR).

It is a continuing theme in medical education reports that effective use of the EHR is an essential educational outcome. Most of our institutions either have or are moving toward implementing an EHR in the primary teaching hospital(s). As noted in Recommendation 3 above, teaching the effective use of evidence-based tools and their application to work in the EHR is essential throughout the learning continuum. AAMC members are currently struggling with the problem of how to ensure proper training of students in use of the EHR and in gathering and using the best evidence for treatment. While the literature contains articles promoting the use of evidence-based resources within the EHR ("Of studies, syntheses, synopses, summaries, and systems: the '5S' evolution of information services for evidence-based healthcare decisions" EBM vol. 11, December 2006), there appears to have been limited integration of evidence-based information tools into the EHR. Integration of institutionally licensed information resources into the EHR appears to be poorly represented, an issue of particular interest to AAHSL.

We propose that a joint review paper be developed as a lead in to further discussion on training in EHR use, use of the EHR as an effective educational tool, and integration of resources into the clinical decision and patient education processes. While admittedly a snapshot of the moment, a review of this nature geared toward the medical educator/librarian audience would give a better base of knowledge for developing action plans than the more technical articles now available. We propose working with AMIA/GEA/GIR as a way of bridging the technical to educational "gap" and drawing in EHR developers as much as possible, both to gather the latest possible information and to establish the working relationships necessary to allow AAHSL members to influence future development.

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AAMC/IIME Report Response Task Force (aka the GEA Task Force)

APPENDICES

Appendix 1: AAMC/IIME Report Response Task Force

Appendix 2: Poster Abstract for AAMC Exhibit

Appendix 3: McGowan JJ, Passiment M, Hoffman HM: *Educating Medical Students as Competent Users of Health Information Technologies: The MSOP Data*

Appendix 4: Two CME Skills Assessments from Ulrike Dieterle, Ebling Library, Health Sciences Learning Center, University of Wisconsin-Madison

Appendix 5: Skills and Competencies Matrix (attached separately)

Appendix 1

AAMC/IIME Report Response Task Force

Julie Sollenberger, Chair

Terry Burton representing CTF;
Karen Brewer (original request to the Board for us to engage this issue);
Representative from current Assessment and Statistics Committee: Carolyn Reid
Representative from the LCME TF: Carolyn Reid
Dottie Spencer – had expressed interest in a committee appointment
Jacque Doyle
Board Liaison, Linda Watson

Charge:

Develop a response to the work of AAMC's Institute for Improving Medical Education that reflects the commitment and expertise of AAHSL and its members to make a difference in the education of students. Report to be submitted to the AAHLS Board by October 30, 2007.

Specific Tasks:

Review two recent AAMC Reports: *Educating Doctors to Provide High Quality Medical Care, A Vision for Medical Education in the United States* and *Implementing the Vision: Group on Educational Affairs Responds to the IIME Dean's Committee Report* (access both from the Institute for Improving Medical Education page: http://www.aamc.org/meded/iime/start.htm) and other AAMC documents as appropriate.

Develop an AAHSL response that draws upon the work of the Charting the Future TF, the Outcomes Assessment Task Force (especially the Education Outcomes), the current Assessment and Statistics Committee, the LCME Task Force recommendations, and other AAHSL work as appropriate.

Consider whether AAHSL should undertake research to address one or more of the issues addressed in the AAMC reports, and consider the potential role of collaboration with others such as GEA/RIME, GIR, or MLA's Research Section, Educational Media and Technologies Section, and/or Medical Informatics Section, or others. If yes, how should the research be structured and funded? For example: do we have evidence among our members of significant progress in showing outcomes of our education offerings in information/knowledge management? All of us are probably developing independent assessment tools; should we develop a collective one that addresses competencies in a consistent and validated way that could be adopted by all schools?

Consider how this work can be extended to other health professions.

ADDITONAL BACKGROUND INFORMATION

AAMC Group on Educational Affairs (GEA)

http://www.aamc.org/members/gea/correspondent/start.htm

AAMC Staff Liaison = M. Brownell Anderson, mbanderson@aamc.org, Senior Associate Vice President, GEA, Division of Medical Education, AAMC, 2450 N St., N.W., Washington, DC 20037-1127, or fax to (202) 828-0972.

The purpose of the GEA is to promote excellence in the education of physicians throughout their professional lives and, thereby, to contribute to improving the health of the public. The GEA is staffed by AAMC staff designated by the AAMC President, currently within the Division of Medical Education, and is governed by the elected members of the National Steering Committee.

GEA is open to individuals with professional responsibility in medical student, resident, and continuing medical education, designated by deans, hospital directors, or academic societies. The GEA national meeting is held each fall in conjunction with the AAMC Annual Meeting, and offers teaching and learning opportunities to all medical education constituents. The program includes Mini-Workshops, Small Group Discussions and plenary sessions. The GEA's Research in Medical Education (RIME) Conference, also held in conjunction with the AAMC Annual Meeting, includes research papers, symposia and abstract sessions. The Innovations in Medical Education Exhibits (IME) are held during the annual meeting. The GEA is organized into four regions and four sections. The GEA has four regions: Southern, Central, Northeast, and Western, corresponding to AAMC regions. Each holds an annual Spring Meeting for faculty, educators and administrators from the member institutions within their respective regions. Regional GEA meetings include sessions and exhibits analogous to those offered at the national meeting, including meetings of regional SIGs.

The four sections reflect the continuum of medical education. They are: Undergraduate Medical Education (UGME); Graduate Medical Education (GME); Continuing Medical Education (CME); and Research in Medical Education (RIME). Members may select two of the four sections to belong to and may sign up for all four section listservs. Additional information may be found under their respective web links.

Fall Issue of their newsletter

http://www.aamc.org/members/gea/correspondent/vol19no2.pdf

Medical Education Research Certificate (MERC)

http://www.aamc.org/members/gea/merc.htm

***NOTE**: Includes a module in Searching and Evaluating the Medical Education Literature.*

Appendix 2

Poster Abstract for AAMC Exhibit, Innovations in Medical Education,
Sunday, Nov. 4 – Monday, Nov. 5

Balancing the Scales with Quality Health Information: An Emerging Alliance

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This poster exhibit will outline growing collaborations among AAHSL (Association of Academic Health Science Libraries), GEA (Group on Educational Affairs), and LiME (Librarians in Medical Education SIGs from all regional GEAs). A map of the United States, with GEA regional groups outlined, will display the names and institutions of librarians already active in these groups. Librarians are natural collaborative partners in medical education and research, with goals and interests that overlap with others in the field. Across the full spectrum of education – UGME, GME, CME, and Research in Medical Education – librarians can contribute their expertise and "weigh in" on issues that relate to access and quality of health information. Areas of interest in common with medical educators/researchers are:

- lifelong learning competencies
- evidence-based practice
- self-directed learning
- patient-centered care
- quality of care and patient safety
- competency-based education
- faculty/instructor development
- interdisciplinary teams
- health literacy
- problem-based learning
- educational technology

An AAHSL Task Force is developing a formal response to the AAMC Report entitled "Implementing the Vision: Group on Educational Affairs Responds to the IIME Dean's Committee Report." Potential partnerships will emerge as academic librarians identify a research and action agenda that meshes with goals expressed by the GEA. The poster exhibit can serve as a natural forum for discussion about these possible collaborations.

APPENDIX 3

Educating Medical Students as Competent Users of Health Information Technologies: The MSOP Data

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Abstract

As more health information technologies become part of the health care environment, the need for physicians with medical informatics competencies is growing. In 2006, a survey was created to determine the degree to which the Association of American Medical College's Medical School Objectives Project (MSOP) medical informatics competencies had been incorporated into medical school curricula in the United States. Methods: a web-based tool was used to create the survey; medical education deans or their designees were requested to complete the survey. Analysis focused on the clinician, researcher, and manager roles of physicians. Results: Seventy usable surveys were returned. Many of the objectives were stated in the schools' respective curricula and the competencies were being evaluated. However, only a few schools taught and assessed the medical informatics objectives that required interaction with health information. Conclusion: To insure that physicians have the knowledge, skills, and attitudes to effectively and efficiently interact with today's health information technologies, more medical informatics concepts need to be included and assessed in all undergraduate medical education curricula in the United States.

Keywords:

Education, Medical, Undergraduate; Medical Informatics; Hospital Information Systems; Decision Support Systems, Clinical

Introduction

Within the next decade, a large majority of hospitals and health care centers in developed nations and many in developing nations will have electronic health records and other forms of health information technology. Physicians will be expected to use these tools to improve patient safety, enhance the quality of care, and reduce costs. This expectation requires that physicians be trained, not as medical informaticians but as knowledgeable users of the health technology tools. However, most education in medical or health informatics has focused on the knowledge and skills needed by informaticians rather than health care professionals

Recently in the United States, the President authorized the creation of the first Office of the National Coordinator for Health Information Technology. Several legislative initiatives were undertaken to promote the use of information technology within healthcare to improve process, quality and safety, thereby improving the health of our citizens. The promise of widespread adoption of electronic health records with the concomitant capabilities of provider order entry, decision support, and data mining for clinical research, as well as quality and safety evaluations, is about to become a reality. However, significant questions exist as to whether or not physicians will have the competencies necessary to effectively use these systems to achieve the goals outlined by the President and legislature.

Europe and Canada have long been leaders in the training of informatics-facile health care providers. The work of the European Centre for Medical Informatics, Statistics and Epidemiology (EuroMISE) has provided an early framework for such education in Europe.[1] The International Partnership for Health Informatics Education is in part an outgrowth of the earlier efforts and, in an environment of increasing globalization, emphasizes the need for international components in informatics education.[2]

Canada was also an early leader in medical informatics education and took a different but equally effective approach by integrating applied medical informatics into the undergraduate medical curricula.[3] However, such education must evolve with the changing technologies and the demand for more and more health care professionals to become information literate has resulted in an evaluation of current practices with more emphasis being given to emerging trends in both informatics and health.[4]

Other nations are beginning to recognize the need for more informatics training in the health professions.[5-7] In an attempt to address these very real issues, the International Medical Informatics Association developed recommendations on education in health and medical informatics.[8] These recommendations are the initial step in developing the educational framework necessary to insure that students possess appropriate qualifications to work in an information technology intensive health care environment.[9]

Leaders in medical informatics in these countries and others are calling for more targeted educational programs to insure that the systems being implemented will have physicians trained to use them.[10] However, the integration of such training into health professions curricula has been difficult at best and quite slow to develop.

Need for such training was beginning to be recognized in the United States in the 1980s with several calls from major organizations to prepare physicians for a future in an automated health care environment by integrating the necessary skills into the educational process.[11-13] However, little was realized in the form of concrete programs from these early inducements.

Understanding the potential impact of the growing interest in health information technology on the practice of medicine, and trying to take a more proactive stance in insuring that undergraduate medical students had a firm grounding in the knowledge, skills and attitudes necessary to become technologically savvy health care providers of the future, the Association of American Medical Colleges in 1998 convened an expert panel to develop educational objectives to satisfy this goal. The medical informatics panel of the Medical School Objectives Project (MSOP) II identified five medical informatics relevant roles played by physicians – lifelong learner, clinician, educator-communicator, researcher, and manager. The recommendations for educational content were developed within this framework and published in 1999.[14]

In part because of the increasing interest on the part of the government in facilitating widespread adoption of health information technology, in part because of the dearth of articles published about new educational programs in medical informatics in undergraduate medical curricula, and in part because of a growing need for information literate physicians, a small group of the educational leadership within the Group on Information Resources of the Association of American Medical Colleges surveyed and analyzed the responses of the 127 United States medical schools to determine whether or not they had implemented the MSOP medical informatics educational objectives and, if so, to what extent were the implemented.

Methods

An initial request to participate in the survey was sent to the respective deans of medical education at the 143 discrete medical schools in the United States and Canada. The deans were asked to either respond to the survey or refer it to someone who was knowledgeable about medical informatics content in the curriculum. The Web-based survey asked participants to respond to questions formulated directly from the MSOP II medical informatics educational objectives. These questions were grouped by the physician role with sub-groupings around concepts.

An initial question addressed whether or not the respondent was familiar with the MSOP Medical Informatics educational objectives. The subsequent questions asked the respondent whether or not each of the objective concepts was taught, had stated objectives, and was assessed. At the end of each of the five role divisions the respondent was asked to indicate who taught the concepts and how the concepts were assessed.

While virtually all of the respondents indicated they were familiar with the MSOP medical informatics educational objectives, the responses differed widely in regards to teaching, stated objectives, and assessment. In following up with a number of the participants about responses, it became apparent that many thought the medical informatics content was being taught as an integrated component of the clinical years. However others from the same institutions, many with long standing clinical information systems, stated that their medical students were exposed to these systems but did not have formal training or experiential learning with these systems.

Because of these discrepancies, a second survey was developed that limited responses to stated objectives and assessment because of the belief that having a stated objective would result in some educational action and would eliminate the possibility of someone assuming rather than knowing that the concepts were being taught.

The request to participate in the survey was again sent to the deans of medical education unless there was a different respondent on the first survey. The second survey was also Web-based and a request for participation was made in early 2006, almost a year after the first survey. Interestingly, individual school responses showed little change, however, several additional schools indicated establishing objectives.

Because the attributes for being facile with health information technology in the today's health care environment focused on three of the five physician roles, the responses for Life-long Learner and Educator-Communicator were not considered for this study. In addition, while data was collected on Canadian medical schools, because of their early embracing of the need to teach medical informatics in undergraduate medical education, only the responses from United States Medical Schools have been evaluated.

Results

Seventy usable surveys were "virtually" returned. Ninety-six percent of the respondents were familiar with the MSOP medical informatics educational objectives and eighty-eight percent indicated that there had been an overall strategy to integrate medical informatics objectives into the curriculum. However, the results of the specific competencies did not support this.

Clinician

Within the sub-group of effective use of clinical information systems, 60% of the respondents indicated that they had a stated objective on retrieving patient-specific information from a clinical information system and 49% assessed the competency. Forty-four percent had a stated objective on displaying selected subsets of information available about a given patient and 36% assess the competency. Forty-six percent had a stated objective about recording specific findings about a patient in a clinical information system while 47% assessed the competency. Forty-six percent had a stated objective on recording orders (CPOE) directing the further care of the patient and 36% assessed the competency.

The sub-group of interpreting laboratory tests scored higher. Seventy percent of the respondents had a stated objective about recognizing the knowledge limitations of standard laboratory measurements and 66% assessed the competency. Seventy-seven percent had a stated objective about demonstrating the ability to integrate clinical and laboratory findings while 86% assessed the competency.

Within the sub-group of incorporating uncertainty explicitly into clinical decision making, fifty-seven percent of the respondents had a stated objective on demonstrating the ability to quantify and communicate the degree of certainty associated with specific items of scientific and clinical information and 50% assessed the competency. Forty-six percent had a stated competency on demonstrating the ability to identify and locate when possible the crucial pieces of missing clinical information and determine when it is appropriate to act on incomplete information and 40% assessed the competency. Sixty-three percent had a stated objective on demonstrating the ability to integrate verbal and statistical sources of medical knowledge with the facts of a specific clinical case and 61% assessed the competency.

Within the critical use of decision support tools sub-group, sixty-nine percent of the respondents had a stated objective on using textbooks and journal articles and 67% assessed the competency. Thirty percent had a stated objective on using diagnostic expert systems and fourteen percent assessed the competency. Twenty-three percent had a stated objective on using advisories or alerts issued from a computer based records and fourteen percent assessed the competency.

In responding to a student's ability to formulate a treatment plan, fifty-seven percent of the respondents had a stated objective that students should demonstrate the ability to express the relative certainties of a differential diagnosis while 69% assessed the competency. Sixty-one percent had a stated objective on expressing the relative risks and benefits of outcomes and treatment options while 66% assessed the competency. Forty-six percent had a stated objective on taking action by balancing risks and benefits while 53% assessed the competency.

Within the sub-group of respecting patient (and physician) confidentiality, 76% of the respondents had a stated objective on demonstrating the knowledge of the legal, ethical and medical issues surrounding patient documentation including confidentiality and data security while 79% assess the competency. Thirty-three percent had a stated objective on demonstrating the ability to use security-directed features of an information system while 27% assessed the competency.

Researcher

The first of the researcher group deals specifically with the use of clinical information systems. Twenty-four percent of the respondents had a stated objective on determining a practice's case mix and 20% assessed the competency. Twenty-nine percent had a stated objective on determining the incidences of diagnoses in a practice and 26% assessed the competency. Forty percent had a stated objective on testing the efficacy of a new treatment and 33% assessed the competency. Fifty-six percent had a stated objective on formulating testable hypotheses and 50% assessed the competency. Fifty-one percent had a stated objective on collecting, organizing, and interpreting data while 53% assessed the competencies.

Within the sub-group about determining what data exist relative to a clinical question or formal hypothesis, seventy-one percent of the respondents had a stated objective for demonstrating the ability to use information technology to locate existing data sources and 60% assessed the competency. Thirty-three percent had a stated object for demonstrating knowledge of data sources (including medical records claims and reimbursement information and online data) at one's own institution by identifying how these might be used to address a specific clinical question posed as research and 20% assessed the competency. Thirty-one percent of the respondents had a stated objective for demonstrating the ability to identify and locate existing data sets no maintained at one's own institution (e.g., national registry data) that might be used to address a specific clinical question posed as research and 16% assessed the competency.

For the sub-group executing a plan for data collection and organizing data for analysis, 24% of the respondents had a stated objective for selecting and appropriate computer database tool for collecting and organizing data and fourteen percent assessed the competency. Twenty-nine percent had a stated objective for properly representing data from a study in a form that is useful and supports computer-based analysis and sixteen percent assessed the competency.

Within the sub-group of analyzing, interpreting, and reporting findings, 23% of the respondents had a stated objective for selecting the appropriate computer software tools for analysis of data and ten percent assessed the competency. Thirty-one percent had a stated objective for using software to perform simple statistical analysis and portraying the results graphically and 23% assessed the competencies. Thirty-one percent had a stated objective for interpreting the reports of statistical software analysis and 27% assessed the competency.

Manager

There are three sub-groups within the Manager grouping. The first of these is the appreciation of the role of information technology in relation to managing the cost of medical care and its impact on individuals and society. Twenty-three percent of the respondents had a stated objective on using on-line sources of health care financing information and eleven percent assessed the competency. Thirty-nine percent had a stated objective on continuous quality improvement and process management and twenty percent assessed the competency. Twenty-four percent had a stated objective on how information technology can be used to develop, implement and monitor compliance with clinical pathways and other forms of patient care protocols and eleven percent assessed the competencies. Thirty-three percent had a stated objective on how clinical information in the aggregated can be used to determine health care services planning for populations and 23% assessed the competency.

Within the sub-group of formulating and making decisions for individuals and groups, 55% of the respondents had a stated objective on demonstrating knowledge of cost/benefit issues in health care and 29% assessed the competency. Fourteen percent had a stated objective on using a decision-analysis package and seven percent assessed the competency. Thirteen percent had a stated objective on using software utilities assessing patients and six percent assessed the competency. Thirty-nine percent had a stated objective on incorporating economic and cost perspectives into decision making and 23% assessed the competency.
The last sub-group dealt with working effectively as an individual in inter-professional groups and as a member of a complex health care system. Nineteen percent of the respondents had a stated objective on using electronic personal and clinical scheduling systems and nine percent assessed the competency. Twenty-one percent had a stated objective on archiving and organizing digital information of personal and clinical import and fourteen percent assessed the competencies. Twenty-four percent had a stated objective on demonstrating knowledge of online resources for legislation, political advocacy, and local health care policy setting and six percent assessed the competency.

General Questions

In all three of the physician role groupings, the content was taught generally through embedding it in core course. A few schools had an elective course in medical informatics and fewer still had a core course in medical informatics. Because the primary mode of teaching was through integration with other content, almost all of the assessment of competencies was done as part of a general educational evaluation schema. However, several schools had tests specific to medical informatics or used these in conjunction with the general assessment methodologies.

Discussion

The medical informatics educational objections presented by the MSOP expert panel were developed around the concept of information discovery and not predicated on computer literacy. For this reason, a number of the competencies can be taught without use of a computer. Examples of this are found in the interpretation of laboratory tests and the ability to formulate a treatment plan.
There were a total of 41 questions in the clinician, researcher, and manager role groups. Of those, 27 required interaction with a clinical information system or some ancillary system containing patient information. Eleven questions involved educational objectives that could be met without such interaction. Three questions related specifically to the competencies within the life-long learner role group but were also closely linked to clinician and researcher information management.

Of the five roles, the greatest number of medical school having stated objectives and competency assessments was found in the life-long learner role. This corresponds to the increase in teaching evidence-based medicine and the greater involvement of libraries for development of knowledge-based searching capabilities. For this reason, the life-long learning correlates, although requiring the use of computers to find information, were grouped separately.

In analyzing the responses by question type, less than a third (30.7%) of the medical school respondents had stated objectives for the 27 questions requiring use of computer systems and only slightly more than a fifth (21.1%) assessed competencies. There was one exception. Sixty percent of the respondents did have a stated objective about retrieval of patient-specific data from a clinical information system and 49% assessed the competency.

Of the three life-long learner correlated questions, approximately two thirds (67.7%) of the medical school respondents had stated objectives and slightly less (62.7%) assessed the competencies. Of those questions that did not require interaction with a computer system, over half (58.6% and 56.7% respectively) of the medical school respondents had both stated objectives and assessment of competencies.

In looking at the raw data and comparing the assessment to the stated objectives in all three of the physician role groups, there were 28 instances in which competencies were assessed within seven sub-groups without having stated objectives. These were virtually all in the clinician role and fell primarily under the non-computer based questions. A possible explanation is that the concept might have been considered too granular to include as a stated objective while it was included as part of a clinical evaluation schema.

Conclusion

Seventy of 127 surveys assessing the degree to which the MSOP medical informatics educational objectives have been incorporated into undergraduate medical curricula in the United Stated were completed. An analysis of these found that while many of the medical informatics concepts relevant to the clinician, research and manager roles were being addressed in the curricula, when broken down by those concepts that required health information technology interaction, only a few schools had stated objectives and fewer assessed the competencies.

The survey respondents were self-selected, and anecdotal information suggests that many who did not complete the surveys chose not to do so because they had little or no medical informatics in their curricula. Also, while these objectives are valid today, as HIT systems evolve and become more integrated into the health care system, the objectives also need to evolve. Some progress has been made but much more needs to be accomplished to insure that physicians will be able to efficiently and effectively use the health information technology being installed in hospitals and health centers.

Acknowledgements

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APPENDIX 4

Two CME Skills Assessments
from
Ulrike Dieterle, Ebling Library, Health Sciences Learning Center, University of Wisconsin-Madison.

Skills Assessment 1

Please circle the corresponding numeric value that best describes your skill level.	No Experience		Some experience		Skilled and comfortable
Computer Skills					
Turn on and safely turn off your computer	1	2	3	4	5
Restart your computer if it becomes locked up	1	2	3	4	5
Open a program using the **Start** menu	1	2	3	4	5
Name the basic computer system parts (mouse, monitor, etc.)	1	2	3	4	5
Use scroll bars and move, resize and close windows	1	2	3	4	5
Use help screens in software programs	1	2	3	4	5
Navigate among folders, create and name folders, delete folders	1	2	3	4	5
Copy or move a file from one folder to another	1	2	3	4	5
Cut/copy and paste text	1	2	3	4	5
Internet Skills					
Use a Web browser (Netscape Navigator or Internet Explorer)	1	2	3	4	5
Type URL in an open box	1	2	3	4	5
Use **Back** and **Forward** buttons to move through Web pages	1	2	3	4	5
Create a bookmark or save a favorite Website	1	2	3	4	5
Locate and click on links in a Web page	1	2	3	4	5
Use search engine (Google) to locate information on the Internet	1	2	3	4	5
Print a Web page	1	2	3	4	5
Download and install a computer program or plug-in	1	2	3	4	5

Please circle the corresponding numeric value that best describes your skill level.	No Experience		Some experience		Skilled and comfortable
Online Communication Skills					
Use email to communicate as major communication tool	1	2	3	4	5
Attach and send documents with email message	1	2	3	4	5
Manage, store and retrieve existing email files	1	2	3	4	5
Compose, send, reply and forward email messages	1	2	3	4	5
Subscribe to and monitor professional listservs or electronic discussion groups	1	2	3	4	5
Participate in asynchronous computer conferencing or online discussions	1	2	3	4	5

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Skills Assessment 2

Education Plan **Date:_____**

Pre-Visit Information Management Self-Assessment **Candidate:____**

Please answer the following accurately and completely. Your input will become a critical element in the development of a personalized and meaningful education program.

1. What types of information are you using to support patient care in your practice or biomedical research needs? Any format – print and/or electronic. (Check all that apply)

   ____Consumer/patient information (handouts, brochures, etc.)
   ____Medical research to support diagnosis and treatment
   ____Clinical decision support systems
   ____Clinical references and guides
   ____Practice guidelines/protocols
   ____Evidence-based materials and resources
   ____Drug information
   ____Health statistics
   ____Federal/state legislation
   ____Funding sources
   ____Other (please specify)_____

2. Please describe in narrative format how you use the computer (include use of desktop, laptops and/or handheld devices). Be as detailed as possible in describing how often you use computers, which tasks you perform using computers and which software/databases you utilize. Feel free to attach response on separate sheet marked #2.

_____

_____

_____

_____

_____

_____

_____

3. In an average **month**, how many times do you use the Internet in your office(s) to support patient care information needs.

   Not used <10 times 10-30 times >30 times

4. In an average **month**, how many times do you use the Internet at home to support **any** information need?

   Not used <10 times 10-30 times >30 times

5. Within an average **6-month period**, how many times do you use a health sciences library?

   Not used <10 times 10-30 times >30 times

6. Within an average **6-month period,** how often have you consulted a health sciences librarian?

   Not used <10 times 10-30 times >30 times

7. Do you utilize National Library of Medicine's **PubMed, Medline** or **other similar databases** ? (If NO, skip to # 8)

   Yes No

   a. **Rank your** skills in constructing focused searches in these databases.

      Low High
      1 2 3 4 5

   b. Ability to apply limits to specific search characteristics to refine and narrow your results in familiar databases

      Low High
      1 2 3 4 5

   c. Structure effective search strategies that reflect your information needs

      Low High
      1 2 3 4 5

   d. Effectively evaluate value of retrieved citations

      Low High
      1 2 3 4 5

   e. Ability to locate help tutorials to improve search strategies

      Low High
      1 2 3 4 5

   f. Ability to retrieve and apply evidence-based resources to your practice

      Low High
      1 2 3 4 5

8. On a scale of 1-5, how confident are you in your ability to find quality medical or health information online?

Low					High
	1	2	3	4	5

9. What is the likelihood, if any, of negative consequences for your practice from lacking information or being misinformed?

Low					High
	1	2	3	4	5

10. How likely is it that you will experience a negative consequence from not accessing resources for current health information?

Low					High
	1	2	3	4	5

11. Rank the effectiveness of your professional support network.

Low					High
	1	2	3	4	5

12. We are interested in knowing where you turn for your medical information needs. Please list **specific resources you use most often** to help you solve patient care problems and to stay up-to-date with current medical information. Responses may include a variety of sources, e.g., *Harrison's*, online clinical resources such as U*pToDate*, titles of medical journals, trusted colleagues, professional meetings and seminars, etc.

Resource	**Frequency of Use**		
_____	daily	weekly	monthly
_____	daily	weekly	monthly
_____	daily	weekly	monthly
_____	daily	weekly	monthly
_____	daily	weekly	monthly
_____	daily	weekly	monthly
_____	daily	weekly	monthly
_____	daily	weekly	monthly
_____	daily	weekly	monthly
_____	daily	weekly	monthly

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Appendix 5

Skills and Competencies Matrix – Please refer to separate spreadsheet, attached.

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