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Recommended Curriculum Guidelines for Family Medicine Residents

Medical Informatics

This document was endorsed by the American Academy of Family Physicians (AAFP), its Center for Health Information Technology (CHIT) and the Society of Teachers of Family Medicine (STFM).

Introduction

This Curriculum Guideline defines a recommended training strategy for family medicine residents. Attitudes, knowledge and skills that are critical to family medicine should be attained through longitudinal experience that promotes educational competencies defined by the Accreditation Council for Graduate Medical Education (ACGME) http://www.acgme.org. The curriculum must include structured experience in several specified areas. Most of the resident's knowledge will be gained by caring for ambulatory patients who visit the family medicine center. Structured didactic lectures, conferences, journal clubs and workshops must be included in the curriculum with an emphasis on outcomes-oriented, evidence-based studies that delineate common and chronic diseases affecting patients of all ages. Targeted techniques of health promotion and disease prevention are hallmarks of family medicine. Appropriate referral patterns and provision of cost-effective care should also be part of the curriculum.

Program requirements specific to family medicine residencies may be found on the ACGME Web site. Current AAFP Curriculum Guidelines may be found online at http://www.aafp.org/cg. These guidelines are periodically updated and endorsed by the AAFP and, in many instances, other specialty societies as indicated on each guideline.

Each residency program is responsible for its own curriculum. ***This guideline provides a useful strategy to help residency programs form their curricula for educating family physicians.***

Preamble

“Medical informatics is the rapidly developing scientific field that deals with resources, devices and formalized methods for optimizing the storage, retrieval and management of biomedical information for problem solving and decision-making.” (Greenes RA, Shortliffe EH. Medical Informatics: an emerging academic discipline and institutional priority. *JAMA 1990;263:1114-20).*

The ultimate concern of the physician is patient welfare, yet the medical knowledge required of physicians is beyond the brain's physical capability. Therefore, physicians must leverage information technology to help ensure safe, high quality care. The acquisition, retrieval and analysis of clinical and administrative data are crucial components of physician proficiency in this expanding field. As commanders of their respective health care teams, physicians must also track tasks and communicate with team members. Electronic health record systems provide the ability to efficiently fulfill these requirements, helping physicians effectively perform their myriad duties and contributing to improved patient outcomes.

This Curriculum Guideline provides an outline of the competencies, attitudes, knowledge and skills that should be among the objectives of training programs in family medicine. This knowledge will lead to optimal patient care through the appropriate evaluation and application of biomedical information and health information technologies at the point-of-care by future family physicians.

Competencies

At the completion of residency training, a family medicine resident should:

- Demonstrate basic computer literacy, utilization and safety in addition to mastery of office productivity and communication software tools. (Systems-based Practice)
- Efficiently use appropriate information resources and tools available to support clinical decision-making at the point-of-care and to promote lifelong professional learning and enrichment. (Patient Care, Medical Knowledge)
- Exhibit understanding of how medical informatics and information technology can be applied to the continuum of care delivery in order to achieve improved efficiency, quality and safety. (Practice-based Learning, Patient Care)
- Be able to access specific, relevant information by performing and appropriately refining database searches through use of necessarily focused medical terminology and concepts. (Medical Knowledge)
- Be able to access, enter and retrieve data related to patient care and efficiently and accurately document clinical encounters, plans of care and medical decision-making via available clinical information systems. (Systems-based Practice, Practice-based Learning)

Attitudes

The resident should demonstrate attitudes that encompass:

- The encouragement of other providers to develop comfort and competency in technology use and to participate in change in order to improve the use of informatics within medical practice.
- The recognition of the utility of provider involvement in the planning, choice, design and implementation of information systems and participating in system change processes and utility analysis at the point-of-care.
- An awareness of the impact of implementing technology to facilitate medical practice and participating in policy and procedural development related to medical informatics.
- The recognition of the relevance of aggregation and analysis of clinical data for improving care quality and patient outcomes.
- The recognition of computer hardware and software system limitations and the need for continual learning in informatics skills, applications and knowledge as technology rapidly changes.
- The recognition of personal knowledge deficits in evidence-based medicine and a commitment to perpetual curiosity and inquiry to resolve them.
- Evaluation of internet-based health materials for quality, accountability, reliability, validity and the utilization of multiple information sources for gathering evidence for clinical decision-making at the point-of-care and for professional learning and enrichment.
- An understanding of the impact of information systems on clinical workflow and communication within multidisciplinary teams.
- An upholding of legal and ethical standards related to data security, confidentiality and patients' right to privacy.

Knowledge

In the appropriate setting, the resident should demonstrate the ability to apply knowledge of:

1. Filtering, evaluating and reconciling information considering its accuracy, validity authority, relevance, degree of certainty, availability and intellectual property issues.

2. Information resources and tools available to support care delivery to patients and populations and to promote lifelong learning.

3. Role of medical informatics in continuous quality improvement and process management (including development, implementation and monitoring of compliance with patient care protocols).

4. The ability to collaborate via networks across multiple sites and contexts using electronic mail, discussion lists, news groups, teleconferencing and related communication technologies.

5. Basic components of computer systems, networks and the nature of computer-human interfaces as they impact patient care.

6. Fundamentals of data modeling and database systems (including the definition and application of controlled vocabularies and structured versus unstructured data types).

7. Individual and organizational change management as it applies to self, patient, family and work environments.

8. Application of information technology at the point-of-care to integrate clinical practice guidelines, documentation guidelines, patient education and training.

9. Policies and procedures to insure the security and confidentiality of patient information and the integrity of computer systems and networks.

10. Available sources of clinical and financial decision support, ranging from textbooks to diagnostic expert systems to advisories issued from a computer-based patient record.

11. Application of aggregation and analysis of clinical data for improving care quality and patient outcomes.

12. Limitations of computer hardware and software systems.

Skills

In the appropriate setting, the resident should demonstrate the ability to independently perform or appropriately refer:

1. Basic computer literacy, utilization and safety (including keyboarding, navigation of operating systems, connection and use of peripheral devices, data storage and backup).

2. Retrieval of information by performing and appropriately refining database searches using logical (Boolean) operators, in a manner that reflects understanding of medical language, terminology and the relationships among medical terms and concepts.

3. The ability to access, evaluate, grade and synthesize data, information and knowledge from multiple sources and apply to clinical practice and professional development.

4. The ability to direct patients to credible online medical information and the use of information management systems for patient education.

5. The ability to access, enter and retrieve data related to patient care and efficiently and accurately document clinical encounters, plans of care and medical decision-making via available clinical information systems.

6. Effectively use office productivity and communication software, including:

a. Word processor
b. Presentation (including multimedia)
c. Spreadsheet
d. Database
e. Web browser
f. Email, instant messaging, video conferencing and other digital messaging tools

7. An understanding of the impact of information systems on clinical workflow and communication within multidisciplinary teams.

8. The ability to analyze patient information needs, access appropriate resources to meet those needs and evaluate effectiveness.

9. The use of applications for structured data entry (including management systems, to record and analyze administrative data).

10. Analysis of ergonomic integrity of work stations, exam rooms and portable technologies in practice.

11. Participation in design of data collection tools for practice decision-making and record keeping and participation in quality management initiatives related to clinical data in practice.

12. An understanding and evaluation of security effectiveness and parameters of systems for protecting patient information and ensuring confidentiality.

Implementation

Curriculum implementation should include both focused and longitudinal experience throughout the residency program. Didactic lectures and journal club should be augmented with instruction regarding principles of the doctor-patient-computer relationship in daily practice. The model-of-care should shift from a reactive, individual model to a proactive, population-based model through technology application. Communication should be emphasized as integral to the effective use of information. Ready access to computer and information resources in the clinical care, administrative and teaching environments should be provided. An efficient and responsive technical support infrastructure should be in place in addition to a faculty “champion” to direct medical informatics training within the program. A baseline needs assessment at matriculation should lead to appropriate practical training of computer skills literacy through tutorials, group and/or one-on-one instruction. Avoid applying technology for its own sake and intimidating those who are anxious about technology. Departments should also measure and report educational outcomes to promote evidence-based approaches to high quality medical informatics training for family medicine residents across the nation.

Resources

Zelnick CJ, Nelson DA. A medical informatics curriculum for 21st century family practice residencies. Fam Med. 2002;34(9):685-91.

Jerant, AF. Training residents in medical informatics. Fam Med. 1999;31(7):465-72.

Association of American Medical Colleges. Medical School Objectives Project. Medical informatics objectives. Washington, DC: Association of American Medical Colleges, 1998.

Web Sites

Center for Health Information Technology
http://www.centerforhit.org/

The AHRQ National Resource Center
http://healthit.ahrq.gov

American Medical Informatics Association
http://www.amia.org/

National Library of Medicine Informatics Training
http://www.nlm.nih.gov/pubs/factsheets/trainedu.html

Nursing Informatics Competencies: Self - Assessment.
http://www.nursing-informatics.com/niassess/index.html

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