



AMERICAN ACADEMY OF
FAMILY PHYSICIANS

AAFP Reprint No. 280

Recommended Curriculum Guidelines for Family Medicine Residents

Scholarly Activity and Information Mastery

This document was endorsed by the American Academy of Family Physicians (AAFP).

Introduction

Each family medicine residency program is responsible for its own curriculum. The AAFP Commission on Education's Subcommittee on Graduate Curriculum has created this guide as an outline for curriculum development, and it should be tailored to the needs of the program.

Through a series of structured and/or longitudinal experiences, the curricula below will support the overall achievement of the core educational competencies defined by the Accreditation Council for Graduate Medical Education (ACGME) and provide guideposts to program requirements specific to family medicine. For updates and details, please refer to the ACGME website at www.acgme.org. Current AAFP Curriculum Guidelines may be found online at 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.

Preamble

Research and scholarly activity are integral parts of family medicine education. The ACGME has emphasized incorporating scholarly activity into the residency training experience through the Core Competencies, and the Family Medicine Review Committee has made the resident scholarly activity a requirement.

In training family physicians, scholarship is broadly defined and may include the discovery, synthesis, or integration of knowledge. Considering the broad landscape of

family medicine and the continuing role of family physicians in the community, family physicians are uniquely positioned to contribute knowledge about common medical problems, the natural history of diseases, the patient-centered medical home (PCMH), health equity, and health care delivery. Qualitative and quantitative research, critical reviews of the literature, and quality improvement projects are examples of scholarly work. Well-designed and well-conducted process improvement projects should also be considered scholarship. Direct involvement in research allows residents to understand the research process and enhances their educational experience. Residents may complete scholarly projects individually or as a team member, and their work may be disseminated in an oral or written fashion to an appropriate forum. A successful scholarly activity curriculum will also address the availability of resources, such as information technology, resident time, and support.

Information management is a skill set that encompasses the acquisition, appraisal, and application of knowledge. Family physicians must integrate large amounts of information into the care of individual patients and populations, frequently within the time constraints of an appointment. This task presents an ever-increasing challenge as new research is constantly generated and needs to be readily accessible to physicians. Training programs have a responsibility to prepare residents for the task of lifelong learning, with the goal of the continued provision of evidence-based care.

As media, such as the internet and television, expose patients to information about various health topics, family physicians are responsible for interpreting and explaining this information to patients within the context of evidence-based medicine. Residents should receive regularly scheduled feedback and real-time feedback to facilitate lifelong learning in all clinical settings.

This curriculum guideline provides an outline of the competencies, which include Patient Care, Medical Knowledge, Interpersonal and Communication Skills, Systems-Based Practice, Practice-Based Learning and Improvement, Professionalism, and other skills that are among the objectives of training programs in family medicine. This allows a foundation for providing evidence-based care and advancing the field by future family physicians. Special attention to the implementation section will help residency programs succeed in this challenging area.

Patient Care

At the completion of residency, a family medicine resident should be able to:

- 1) Demonstrate the ability to ask answerable questions applicable to the direct clinical care of patients
- 2) Demonstrate the ability to use point-of-care evidence-based information and guidelines to make clinical decisions
- 3) Use evidence-based sources to identify the risks and benefits of different preventive treatment and management options

- 4) Working with individual patients and families:
 - a) Continually and actively question one's knowledge base and practice methods with specific patients and patient problems
 - b) Formulate clear and focused clinical questions that are important to the patient and/or to clinical management, and that is:
 - i) Answerable by a well-performed literature search
 - ii) Meaningful to the patient
 - c) Share findings with the patient and develop plans of implementation and outcome assessment
 - d) Guide more junior clinical learners in information management while supervising their patient care
 - i) Guide them in looking for unresolved issues that can be translated into important clinical questions
 - ii) Help them formulate such questions in an answerable form
 - iii) Guide them in accessing a medical literature database and identifying useful published studies to answer the question
 - iv) Discuss the implications of findings for current clinical management problems

Medical Knowledge

In the appropriate setting, a family medicine resident should demonstrate the ability to apply knowledge of the following:

- 1) Posture of perpetual curiosity and inquiry in approaching knowledge deficits
- 2) Ability to critically review and practice evidence-based medicine
- 3) Involvement in scholarly activity in family medicine
- 4) Harms and nuances of race-based medicine
- 5) Ability to identify areas for improvement within one's clinical practice
- 6) Relevant, answerable clinical questions
 - a) Population
 - b) Intervention
 - c) Comparison
 - d) Outcome
- 7) Information sources
 - a) Journals and textbooks
 - b) Internet-based search tools
 - c) Practice guidelines
 - d) Point-of-care tools
- 8) Statistical principles

- a) Risk reduction
 - i) Absolute
 - ii) Relative
 - b) Odds and risk ratios
 - c) Confidence intervals and p-values
 - d) Number needed to treat/harm
 - e) Likelihood ratios/pre-test probability/post-test probability
 - f) Power
- 9) Grading evidence
- a) Levels of evidence
 - b) Strength of Recommendation Taxonomy (SORT)

Interpersonal and Communication Skills

It is assumed that the residency program will have an electronic health record (EHR) system and be working to implement the full model of the patient-centered medical home.

At the completion of residency, a family medicine resident should be able to:

- Assess processes and outcomes of health maintenance and disease management through ongoing EHR monitoring and compare with the patient's care goals and accepted standards
- Inform members of the health care team of new and clinically relevant research findings and their effect upon the delivery of patient care

Systems-Based Practice

Family physicians function in multiple professional domains, often simultaneously. A family physician's scholarship and information management skills will vary based on the domain of activity in which the family physician is functioning.

At the completion of residency, a family medicine resident should demonstrate the ability to apply knowledge of the following:

- 1) Health policy and health services resources and research
- 2) Practice-based research networks
- 3) Educational research
- 4) Health equity
- 5) Family physician domains of activity
 - a) Care provider
 - i) Evidence-based disease management and health maintenance
 - ii) Discussion of relevant clinical research studies and assistance in enrollment,

- if desired
 - b) Health care team leader
 - i) Monitoring and management of a health care delivery system (e.g., medical office)
 - ii) Identification of areas for improvement
 - iii) Implementation of measures to improve the function of a health care delivery system and measure the impact
 - c) Learner
 - i) Acquisition, evaluation, and integration of clinically relevant findings from scholarly investigation
 - d) Investigator
 - i) Participation in scholarly investigation as a clinical investigator
 - ii) Evaluation of medical education from a scholarly perspective
- 6) Working with a team of clinical investigators
- a) Complete training and certification in “ethical principles of research with human subjects”
 - b) Formulate clear and focused research questions that are important to patient care, public health, or practice management
 - c) Translate research questions into clear, specific, and well-grounded hypotheses
 - d) Develop annotated reference lists of the most important relevant research on topics of interest
 - e) Contribute a “family physician perspective” and clinical content expertise to a research team composed of:
 - i) Research design methodologist
 - ii) Clinical content expert
 - iii) Statistical methodologist
 - iv) Clinical database manager
- 7) Identify an available study population appropriate for the study question by incorporating a health equity perspective
- 8) Co-write the Institutional Review Board application
- 9) Working with the health care team and community:
- a) Develop a profile of the demographics of the local community and its major health problems based on data from the EHR and local community epidemiological data
 - b) Develop a profile of the demographics of the community as a whole and its major health problems based on data from the EHR and local community epidemiological data, and work with colleagues and community members to identify and address areas of concern by performing a community needs assessment
 - c) Access the EHR to generate reports of one’s clinical performance, identify areas of concern, and implement process improvements based on the strongest available clinical recommendations

- d) Formulate important and answerable questions about the performance of individual clinicians and the practice in key areas of health maintenance and disease management
- e) Design and conduct assessments of practice performance using key data sources other than the EHR, such as care team informants and patient groups (e.g., group sessions, surveys, interviews)
- f) Identify areas of health disparities
- g) Collaborate with practice colleagues to evaluate, modify, and implement clinical guidelines into the practice

Practice-Based Learning and Improvement

At the completion of residency, a family medicine resident should be able to:

- 1) Complete two scholarly activities, at least one of which should be a quality improvement project
- 2) Formulate a searchable question from a clinical question
- 3) Demonstrate the ability to apply a set of critical appraisal criteria to different types of research that includes evaluation of study design, associated types of biases, and measured outcomes
- 4) Recognize bias in research
 - a) Selection bias
 - b) Measurement bias
 - c) Intervention/exposure bias
 - d) Reporting bias
- 5) Properly format research reports
 - a) Abstract
 - b) Introduction
 - i) Purpose and relevance of research question
 - ii) Literature review
 - c) Methods
 - i) Sample
 - ii) Study design
 - iii) Outcome measures
 - d) Results
 - e) Discussion/conclusions
 - i) Meaning and implications
 - ii) Generalizability of findings
 - iii) Strengths and limitations
 - iv) Further research
- 6) Identify modes of dissemination
 - a) Presentation formats

- i) Oral presentation
 - (1) Lectures
 - (2) Seminars
 - (3) Workshops
 - ii) Poster presentation
 - b) Publication types
 - i) Case report or series
 - ii) Review article
 - iii) Original research
 - iv) Book chapter
 - v) Online and other electronic resources
 - vi) Blogging and social media
 - c) Identify the most relevant published studies through literature searches
 - d) Evaluate the relevance of published recommendations based on the strength of evidence criteria. For original studies, evaluate the relevance of the findings based on:
 - i) Strength of study design
 - ii) Comparability of the study population and the clinical circumstances
 - iii) Sources of bias, confounding, and other challenges to study validity
 - e) Understand the steps and processes involved in the enrollment of patients and families in studies and clinical trials, including contact and informed consent
- 7) Be adept at being a student, teacher, resource to colleagues, and lifelong learner
- a) Lead a journal club session that reviews an original clinical study, selecting a study that has a potentially practice-changing impact. Prepare for the session by accomplishing these steps:
 - i) Identify the importance and quality of the question(s), and the logic and strength of the hypothesis or hypotheses
 - ii) Evaluate the introductory justification for the study and the quality of the literature review on which the current study is based
 - iii) Identify the study design, its suitability for the question, and whether it is the correct “next step” in this line of research; identify potentially useful alternative designs
 - iv) Critique the merits of the study population in terms of applicability to the current practice, how well it supports the generalizability of findings, the rationale of exclusions and inclusions, sampling techniques, potential biases, contaminations, subject loss, etc.
 - v) Evaluate the power of the study and adequacy of the sample size based on the study design, the stated hypotheses, and the expected effect size.
 - vi) Assess the strength of the measurement tools and methods
 - vii) Identify the type of data (qualitative; quantitative; categorical, ordinal, or continuous ratio)
 - viii) Identify the potential distribution of data and its effect on analytic methods (i.e., parametric versus nonparametric)
 - ix) Critique the suitability and strength of the data analysis methods, considering the study design and nature of the data

- x) Evaluate the presentation of the results in terms of completeness, clarity, statements of significance and uncertainty, and validity
- xi) Assess the validity of conclusions and whether they are justified by the results or are biased; evaluate the generalizability and clinical significance of the findings
- xii) Propose the basic elements of a useful subsequent study in this line of research
- b) Compose and deliver a lecture or seminar on a relevant clinical topic based on a review of high-quality and up-to-date primary research literature
 - i) Work with a mentor who provides critique and resources as the talk is developed
- c) Develop a personal program of continuing medical education (CME)
 - i) Devise a multifaceted self-assessment program and complete certification for the American Board of Family Medicine (ABFM)
 - ii) Assess the quality of the CME and clinical information options based on “strength of evidence”
- d) Participate in ensuring the integrity of data collection, storage, transfer, and analysis
- e) Ensure that the data analysis remains guided by the stated hypotheses, avoiding “data mining” if it is not an explicitly exploratory study
- f) Critique the study results in terms of credibility, potential sources of biases and confounding, statistical and clinical significance, generalizability, and comparisons to results of other studies
- g) Prepare and present a poster or oral report of the study, working closely with your research team members/mentors on issues of verbal, graphic, and tabular presentation
- h) Promote and facilitate association with a practice-based research network
- i) Determine the appropriateness of quantitative and/or qualitative research methods in consultation with a research team
- j) Make a credible assessment of subject availability and probable sample size
- k) Explore grant funding opportunities from federal, state, and private organizations
- l) Co-author an informed consent document that is appropriate for the study population, with sensitivity to the language and culture, general literacy, and health literacy of the study population
- m) Co-develop measurement tools, such as surveys, with attention to simplicity, understandability, and relevance to the hypotheses, reliability, and validity

Professionalism

At the completion of residency, a family medicine resident should be able to:

- 1) Demonstrate knowledge of the principles of ethics as it applies to medical research and the process of evaluating the potential ethical implications of proposed research projects
- 2) Provide sensitive and open liaison between the research team, office staff, and patient subject groups

- 3) Demonstrate principles of research ethics
 - a) Autonomy
 - b) Nonmaleficence
 - c) Beneficence
 - d) Justice

Implementation

Scholarly activity and information management should be integrated into residency training longitudinally. Evidence-based, point-of-care resources may be utilized for inpatient care in inpatient and outpatient settings. The process of searching for high-quality, evidence-based answers to clinical questions should be modeled by faculty at every opportunity and in all settings.

In creating scholarly activity, a community needs assessment and research about health disparities are highly encouraged. Didactic sessions and hands-on experiences, such as a library resource workshop and a recurring, interactive journal club, should also be utilized. Didactic sessions on research methodology should be incorporated into the curriculum. Collaboration should be encouraged during the production of scholarly work. Residents should be given regularly scheduled and real-time feedback targeted at their ability to incorporate evidence-based medicine into their daily clinical practice.

Residents should be given protected time free from clinical and administrative duties to work on scholarly projects. Residencies should provide venues for residents to present completed projects. Residents also should be afforded ample opportunity to publish or present work at regional and national conferences. Active participation in all steps of the production of scholarship is the best way to introduce learners to the topic.

Faculty development in scholarship and research methodologies is critical and should be made available to all interested faculty through internal or nationally available programs. Faculty with experience in critical appraisal and scholarly work should be available to model and lead these efforts. Faculty should be given protected time to pursue their scholarly work and mentor residents. Program directors should also be actively engaged in scholarly activity. Resident and faculty scholarship achievements should be prominently displayed in the facility. Residencies with insufficient faculty expertise can explore other ways to enhance their scholarship (e.g., partnering with local colleges and universities, joining practice-based research networks). A library with access to full-text journal articles should also be provided.

Funding is a significant constraint on residents' scholarly activity. Funding difficulties can be overcome by carefully selecting inexpensive projects, utilizing technical assistance in grant writing, collaborative involvement in already funded projects, and active participation in practice-based research networks.

Residency programs that are successful at resident scholarship typically feature the following characteristics:

- Program director support of research
- Designated faculty member as the director of scholarly activity with protected time
- Protected time for residents to perform research
- Faculty involvement in research
- Presence of a research curriculum
- Regular journal club
- Easily accessible research professionals
- Opportunities for residents to present research
- Recognition for resident scholarly work
- Initiation of scholarly activity by residents early in training

Resources

Accreditation Council for Graduate Medical Education. ACGME program requirements for graduate medical education in family medicine. Accessed September 1, 2021.

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Website Resources

Society of Teachers of Family Medicine (STFM) Resource Library.

<https://connect.stfm.org/resourcelibrary/home> (requires login to STFM account)

University of Alberta. Evidence-Based Medicine Toolkit. www.ebm.med.ualberta.ca/

First published 10/1992

Revised 07/1998

Revised 06/2003

Revised 01/2009 by Rose Family Medicine Residency Program

Revised/Title change 06/2011 by STFM Group on Teaching Research in Residency

Revised 06/2015 by University of Pittsburgh Medical Center (UPMC) McKeesport Family Medicine Residency Program, PA

Revised 09/2021 by ProMedica Monroe Family Medicine Residency Program, Monroe, MI