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Recommended Curriculum Guidelines for Family Medicine Residents

# Information Management and Scholarly Activity

*This document is endorsed by the American Academy of Family Physicians (AAFP), the Association of Departments of Family Medicine (ADFM), the Association of Family Medicine Residency Directors (AFMRD) and the Society of Teachers of Family Medicine (STFM), and was developed in cooperation with the Rose Family Medicine Residency Program.*

## 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**

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. This task presents an ever-increasing challenge as new research is constantly generated that may impact practice. Training programs have a responsibility to prepare residents for the task of life-long learning with the goal of continued provision of evidence-based care.

In the context of training family physicians, scholarship is broadly defined and may include the discovery, synthesis or integration of knowledge. Considering the ecology of medical care, family physicians are uniquely positioned to contribute knowledge about common medical problems, the natural history of disease, and health care delivery. Qualitative/quantitative research, critical reviews of the literature, and quality improvement projects are examples of scholarly work. Residents may complete scholarly projects individually or as a member of a team. Their work may be communicated in oral or written fashion to an audience of medical students, peers, faculty and/or the public. A successful curriculum will also address the availability of resources, including information technology, resident time, and support.

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, laying a foundation for the provision of evidence-based care and advancement of the field by future family physicians.

## **Competencies**

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

- Demonstrate the ability to ask answerable questions applicable to the direct clinical care of their patients (Medical Knowledge).
- Demonstrate the ability to search, find, and appraise both primary and secondary information sources for answers to these clinical questions (Practice-Based Learning and Improvement).
- Demonstrate the ability to apply this information to the care of their patients (Patient Care).
- Complete a scholarly project (Interpersonal and Communication Skills, Professionalism).

## **Attitudes**

The resident should demonstrate attitudes that encompass:

- A posture of perpetual curiosity and inquiry in approaching knowledge deficits.

- A desire to practice evidence-based medicine.
- An appreciation of the importance of scholarly activity in family medicine.

## **Knowledge**

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

1. Answerable clinical questions
  - a. Population
  - b. Intervention
  - c. Comparison
  - d. Outcome
2. Information sources
  - a. Written
  - b. Handheld-based
  - c. Internet-based
3. Outcomes and effect sizes
  - a. Risk reduction
    - i. Absolute
    - ii. Relative
  - b. Odds/risk ratios
  - c. Confidence intervals and p-values
  - d. Number needed to treat/harm
4. Grading evidence
  - a. Levels of Evidence
  - b. Strength of Recommendation Taxonomy
5. Study designs
  - a. Interventional trials
    - i. Randomized controlled trials
    - ii. Historical controlled trials
    - iii. Crossover trials
    - iv. Factorial design trials
  - b. Observational studies
    - i. Cohort studies
    - ii. Case-control studies
    - iii. Cross-sectional studies
    - iv. Ecological studies

- c. Meta-analysis
  - d. Systematic review
6. Principles of research ethics
- a. Autonomy
  - b. Beneficence
  - c. Justice
7. Written study elements
- a. Abstract
  - b. Introduction
    - i. Purpose and relevance of research question
    - ii. Literature review
  - c. Methods
    - i. Appropriate sample
    - ii. Study design
    - iii. Outcome measures
    - iv. Analysis
  - d. Results
  - e. Discussion/conclusions
    - i. Meaning and implications
    - ii. Strengths and limitations
    - iii. Further research
8. Modes of dissemination
- a. Oral communication
    - i. Case conference
    - ii. Grand rounds
    - iii. Conference presentation
  - b. Written communication
    - i. Case report
    - ii. Book chapter
    - iii. Narrative review article
    - iv. Evidence-based review article
    - v. Original research article
9. Participatory research
10. Health policy and health services research

## **Skills**

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

1. Literature searches.
2. Evaluations and grading of evidence.
3. Utilization of evidence-based medical information resources.
  - a. Identify reliable sources.
  - b. Interpret treatment and screening recommendations.
  - c. Interpret and apply clinical decision rules.
4. The application of appropriate evidence in clinical decision-making, taking into account patient preferences, cost and local standards of care.
5. Presentation of the results of a scholarly project.

## **Specific Skills**

1. Research question formulation
  - a. Identify a question to investigate.
  - b. Establish a clear purpose of the research.
  - c. Translate the general question into specific hypotheses.
  - d. Define variables and terms operationally.
  - e. Recognize the difference between independent and dependent variables.
  - f. Determine how each variable will be measured.
  - g. Evaluate the reliability and validity of a given instrument.
2. Study design
  - a. State the purpose, strengths and limitations of each design.
  - b. State the relationship between the chosen research design, the type of data collected and the necessary statistical techniques.
  - c. Thoroughly analyze the dominant research designs used in the area of study.
  - d. Prepare for and use design specialist consultation.
  - e. Recognize sources of error in the study and methods of minimizing error.
  - f. Obtain institutional Review Board approval or exemption, if necessary.
3. Data collection and analysis
  - a. Distinguish inferential from descriptive statistics.
  - b. Determine the population and appropriate sample, including size and technique.
  - c. Understand the application of commonly used statistical functions, e.g., chi-square, t-test, analysis of variance, correlations and multiple regressions.

- d. Construct a plan for managing data files and analyzing data according to level of measurement and research design.
  - e. Prepare for and use consultation with computer analysts and statisticians.
  - f. Be familiar enough with statistical packages to direct computer personnel in the appropriate analysis.
  - g. Interpret printouts on common analyses from statistical packages for the research area.
  - h. Understand how to graphically summarize data.
  - i. Report results correctly and be able to cite both strengths and limitations of the study based on the design and analysis.
4. Study evaluation and discussion
- a. Explain the outcome of given analyses in terms of the originally stated hypothesis.
  - b. Conduct additional literature review as needed to elaborate on findings and their implications for a given body of research.
  - c. Integrate the research findings with the existing literature by discussing what is known and unknown and implications for further study.
  - d. Express appropriate cautions in interpreting results and base these cautions on methodologic and theoretic conditions.
  - e. Place the study in the context of existing research and justify its contribution to important questions in the area.
5. Writing a research paper
- a. Implement a system for abstracting/documenting literature and other sources of information on a topic.
  - b. Use frameworks for structuring material, e.g., diagrams, notes, content outlines, mini-drafts in a publication format.
  - c. Schedule a timetable for writing that encourages systematic and frequent writing sessions.
  - d. Build in a mechanism for evaluation and revision.
  - e. Appropriate scientific writing
    - i. Write in the active voice with gender-neutrality and cultural sensitivity.
    - ii. Employ economy of expression.
    - iii. Avoid or decode jargon.
    - iv. Avoid both pompous and overly tentative statements.
    - v. Construct graphs, charts, tables and figures according to reference guidelines.

## Implementation

Information management can be integrated into residency training in a longitudinal fashion. Evidence-based point-of-care resources should be utilized in the context of patient care in both the inpatient and outpatient settings. Didactic sessions and hands-on experiences (such as a library resource workshop and a recurring, interactive journal club) should also be utilized. Production of scholarly work should be accomplished with the guidance of faculty mentors and may require the use of elective time. Faculty with experience in critical appraisal and scholarly work should be available to model and lead these efforts. A library with access to full-text journal articles should also be provided.

## Resources

Ebell MH, Siwek J, Weiss BD, Woolf SH, Susman J, Ewigman B, Bowman M. Strength of Recommendation Taxonomy (SORT): A patient-centered approach to grading evidence in the medical literature. *J Am Board Fam Pract* 2004;17(1):59-67.

Green LA. The research domain of family medicine. *Ann Fam Med* 2004;2(Suppl 2):S23-29.

Phillips B, Ball C, Sackett D, Badenoch D, Straus S, Haynes B, Dawes M. Levels of Evidence. Oxford Centre for Evidence-Based Medicine 2001.

Slawson DC, Shaughnessy AF. Teaching evidence-based medicine: should we be teaching information management instead? *Acad Med* 2005;(80):685-89.

Starfield B, Shi L, Macinko J. Contribution of primary care to health systems and health. *Milbank Quarterly* 2005;83(3):457-502.

Straus SE, Richardson WS, Glasziou P, Haynes RB. Evidence-Based Medicine: Elsevier, 2005.

## Web Sites

University of Alberta EBM Toolkit  
<http://www.ebm.med.ualberta.ca>

Centre for Health Evidence Users' Guide to Evidence-Based Practice (originally published as a series in JAMA)  
<http://www.cche.net/usersguides/main.asp>

NAPCRG (North American Primary Care Research Group) FM research FAQ  
<http://www.napcr.org/studresresearch.pdf>

AFMO (Academic Family Medicine Organizations) site with resources for FM researchers <http://www.fmresearch.org>

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