

The Family Medicine Physician-Scientist Pathway (FM-PSP) Program

An ABFM-approved Pilot Program of Integrated Mentored Research Training During Residency

Summary of the Program

In October 2017, the Board of Directors of the American Board of Family Medicine (ABFM) approved a Family Medicine Residency Research Pathway (*The Family Medicine Physician-Scientist Pathway*) as a pilot program that can be provided as an option on the National Resident Match Program (NRMP) beginning in 2019. The program is designed to meet the needs of those who wish to pursue a career of independently-funded research.

Rationale: Physician-scientists integrate unique clinical insights into research and can help bridge clinical care and scientific discoveries. Family medicine lags behind other primary care specialties in contributing to empirical research. Other primary care specialties employ a residency research pathway to recruit medical students with concurrent interest in a research career, but the specialty of family medicine has lacked this essential tool. The need for this program is underscored by the fact that 75% of Association of Departments of Family Medicine (ADFM) members endorsed the *Physician-Scientist Pathway (FM-PSP)* concept in a 2016 Annual ADFM Membership Survey.

This program addresses the urgent need to increase: 1) the capacity in the specialty to develop leaders in academe; 2) the number of independently funded family physician-scientists to advance high-priority research; and 3) the capacity to expand the pool for talented residents. The pilot will help demonstrate sustainability of the program, as well as the feasibility of institutionalizing research as a career path through family medicine residency programs.

Description: The program builds on the foundation and tradition of excellence in clinical training. Thus, residents will meet clinical training requirements with verification by the residency program director of eligibility for ABFM certification. A distinction of the program is the coordinated training and mentoring to develop the skills necessary to become an independently funded physician-scientist. Trainees will develop skills in quantitative and/or qualitative research, and scientific writing with expectations of high-quality peer-reviewed publications and competitive NIH K-awards, R-type, or similar grant applications at the end of the training period. They will have the option to complete a Master's degree in health policy, population health, public health, or related fields, that will be tailored to the needs of individual trainees.

There will be flexibility in how residents enter or exit the program via two track offerings, but continuity in both clinical and research training is required. In Track 1, residents will select the *FM-PSP* through the NRMP and begin the training in PGY1. Residents who later develop interest in research (Track 2) will begin research training during PGY2. Both tracks will be for five years.

Eligible participating sites: For the pilot, five well-resourced departments will each admit one resident per year who has a demonstrated potential to become a successful independently-funded researcher. Each participating department is required to demonstrate access to mentors, sponsors, and methodological experts in areas such as mixed methods research, biostatistics, and epidemiology.

Oversight: The program is overseen by a steering committee comprised of diverse stakeholders involved in implementation, including residency program directors, research directors, and RRC. Annual reports will be provided to the ABFM, ADFM, NAPCRG, STFM, AFMRD, and other key stakeholders such as funders.

Measures: Success will be measured on recruitment, retention, and program completion rates; trainee career choices; peer reviewed publications; and funded grants.

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Rationale for a Residency Research Pathway Program

Family medicine delivers high-quality and comprehensive primary care and helps drive groundbreaking research to improve the quality and outcomes of care across the lifespan. Research in family medicine departments can be led by non-physicians, but family medicine physician-scientists bring unique perspectives and skills to research. The research of family medicine physicians is informed by their clinical experiences and those of their peers; they can help the specialty better integrate the experiences and observations of family medicine physicians when prioritizing research investments. Developing a strong physician-scientist workforce in family medicine is thus critical for aspirations of national leadership on population health, practice transformation, and other crucial areas that are strengths and opportunities for the specialty.

Increasingly sparse and competitive extramural NIH-funding and poor research infrastructure contribute to the weakening national physician-scientist workforce pipeline. This threat is particularly acute for family medicine, which historically lags behind other specialties in competitive federal funding for investigator-initiated research and has a lean repertoire of primary care research training programs during formative training years. This threat is compounded by relatively weak internal resources in many departments to develop a pipeline of researchers.

Recognizing similar workforce needs, several specialties, including internal medicine, pediatrics, and dermatology, developed formal residency research pathways to help strengthen their physician-scientist pipelines. A residency research pathway can be a crucial tool for attracting medical students who have concurrent interest in a research and/or academic career. Family medicine currently lacks this essential tool and the *FM-PSP* aims to:

- Increase capacity in the specialty to develop leaders in academe
- Effectively address the dearth of independently funded researchers who are also boarded in family medicine to advance high-priority research in the specialty
- Increase opportunities for the pool of talented medical students interested in academic family medicine
- Serve as a strong indicator of commitment to research careers in the specialty

Supporting Evidence

The pilot draws on data gathered through an extensive process of engagement of family medicine leaders, including department chairs, residency program directors, researchers, and the Residency Review Committee (RRC). All have endorsed the program. **In a survey by the ADFM, 82 of 110 (75%) family medicine departments expressed interest in the concept.** The emerging consensus is that:

- Trained family physicians can and should lead, or collaborate in, research to generate and disseminate new knowledge to advance the care of patients and the specialty
- An integrated research training program may help attract additional applicants to family medicine and further enhance the scientific status of the specialty nationally
- An integrated physician-scientist pathway can enrich the learning experience for all residents
- A strong family medicine physician-scientist pipeline will help bridge gaps in research and practice, and answer important questions relevant to family medicine
- Developing leaders for research in population health, a central theme in health care reform, is critical as health care delivery moves towards value-based care

The *FM-PSP* program will further help seed academic departments with physician-scientists, and enhance the capacity in academic family medicine departments to increase the number of competitively-funded grants.

How the *FM-PSP* Program Changes Current Family Medicine Training

Training in research is encouraged for all family physicians to equip all clinicians to apply evidence-based practices in direct patient care, population health management, and community health. The *FM-PSP* is designed to: 1) formally integrate training in conducting research and generating new evidence for use in clinical family medicine, and 2) prepare trainees for careers in academic medicine with the formal training to become independently-funded clinician-investigators in family medicine-related research and to serve as future mentors. The *FM-PSP* is recommended for residents who intend to pursue a career in clinical or population-based research. Family medicine physicians who intend to devote their careers mainly to teaching or clinical activities should pursue standard clinical training or other career pathways. The following sections provide details of the program.

The ABFM Family Medicine Physician-Scientist Pathway of Research Training in Residency

Responsibility for Training and Notification of ABFM

The residency program director is responsible for the training and must approve the resident to pursue the research pathway and coordinate the resident's training, including experiences at other institutions. The program director will work with the department chair and research director to provide the resources to support research training either within the parent department, school, or partnered institution or consortium.

The training experience in this pathway will be documented through ABFM's Residency Training Management (RTM) system. **ABFM should be notified by the program director via RTM of formalized commitment no later than spring of PGY2.**

Selection of Candidates for the Program

Interested trainees will be identified through a pre-interview questionnaire to be developed jointly by the AFMRD and ADFM to help inform recruitment conversations, ideally with prospective mentors, during the interview process. To the extent possible, departments should only accept trainees whose declared interests match the resources available.

Family Medicine Training

The research pathway does not change the requirement that the clinical training must meet the standard Core Competencies and other requirements for ABFM board-certification. Ratings of satisfactory clinical performance must be maintained annually for each trainee in the Research Pathway. At the end of training, the residency program director is required to **verify** to the ABFM the candidate's competence in:

- (1) Patient care and procedural skills
- (2) Medical knowledge
- (3) Practice-based learning and improvement
- (4) Interpersonal and communication skills
- (5) Professionalism
- (6) Systems-based practice during all years of training

The *FM-PSP* trainee must complete at least 24 months of clinical training with a minimum of 20 months in direct patient care responsibilities, including at least a one half-day per week in a continuity clinic throughout the training period (*Table 1*). The structure of clinical training in the *FM-PSP* should consider the following:

- Clinical training may be frontloaded with the heavier rotations, allowing for greater flexibility during PGY3 through PGY5
- Provide a broad range of clinical experiences across the lifespan and appropriate load of inpatient work, including night float, tailored to the needs of the resident and the program
- Residents are expected to participate in didactics and call during the research-focused years
- Encourage integration of *FM-PSP* residents with those in the traditional program including opportunities to present on components of their research experience as part of the didactic curriculum

Continuity Patient Care Requirement

As shown in *Table 1*, the patient care continuity requirements are the same for the *FM-PSP* residents as for other family medicine residents. Trainees must fulfill the minimum of 1,650 continuity patient encounters required for ABFM certification by PGY5. The *FM-PSP* may have an added advantage in providing longer ongoing relationship of patient with the resident primary care physician for the expanded training period.

Impact of Changing from the Research Pathway

The program requires prospective planning by trainees and program directors to maximize the experience. Entry implies a commitment to its completion, although, during the pilot, flexibility is provided to both "off-ramp" or "on-ramp." Trainees who change their career path from the *FM-PSP* will become eligible for the ABFM Certification Examination after completing 3 years of required clinical training as verified by the program director.

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Table 1. Sample Block Schedule for Integrated Research and Clinical Training for the FM-PSP (weeks)

First Year	Second Year	Third Year	Fourth Year	Fifth Year
Continuity Clinic*	Continuity Clinic*	Continuity Clinic*	Continuity Clinic*	Continuity Clinic*
Adult Inpatient Service (8)	Adult Inpatient Service (8)	Adult Inpatient Service (4) Adult Intensive Care (4)	Clinical Elective (4)	Required Core Course 5
Adult Emergency Medicine (4)	Adult Emergency Medicine (4)	Health Systems Management (4)	Required Core Course 3	Required Core Course 6
Geriatrics (4)	Newborn/NICU (4)	Clinical Elective (4)	Required Core Course 4	Elective Research Course 3
Outpatient Pediatrics (8)	Inpatient Pediatrics (4)	Bioethics Training (Required)	Elective Research Course 1	
	Pediatric Emergency Medicine (4)	Required Core Course I		
Newborn/ NICU (4)	Dermatology (4)	Required Core Course 2	Elective Research Course 2	Elective Research Course 4
Gynecological (4)	General Surgery (4)			
Obstetrics (4)	Obstetrics (4)	Research Seminars	Research Seminars	Research Seminars
MSK/Sports Med (4)	MSK/ Sports Med (4)	Data Management (required)	Mentored Thesis Research	Mentored Thesis Research/ Defense
Community Health (4)	Integrated Behavioral Health (4)	Mentored Thesis Research		
PCMH/Pop Health (4)	Clinical Elective (4)			
Mentored Research†(4)	Mentored Research ‡ (4)			

Note: Numbers in parenthesis for clinical training indicate the weeks. Because research activities are less structured, no specific time allocations are provided, instead the allocated slots provide an estimate of time commitment for each activity. *Ambulatory continuity clinic. †Establish mentoring, develop an IDP, develop research concentration, and obtain HIPAA certification. ‡Update IDP, conduct and present literature on selected concentration, and obtain human subject research certification.

Allocation of Time in the FM-PSP and Potential for Appointment as Junior Faculty

Trainees in the FM-PSP must commit at least 36 months of research training at 70% in PGY3 and 80% in PGY4 and PGY5 (Table 2). The last year of the research pathway may be undertaken in a full-time junior faculty or instructor position with the level of commitment to mentored research maintained at 80%.

Table 2. Hours of Dedicated Clinical and Research Training per Year in the Program

	Planned average number of hours per 40-hour week, PGY by Track									
	Track 1					Track 2				
	PGY1	PGY2	PGY3	PGY4	PGY5	PGY1	PGY2	PGY3	PGY4	PGY5
Clinical training	28	28	12	8	8	40	20	8	8	8
Mentored research	12	12	28	32	32	0	20	32	32	32

Training Tracks

Two tracks will be offered in the program with the ability to “on-ramp” and “off-ramp” (Table 2). In Track 1, trainees will begin the pathway in PGY1. This track is intended to balance both clinical and research experiences over the five-year program more evenly. In Track 2, trainees who later decided to pursue a research track will begin integration in PGY2 or PGY3. With clinical training front-loaded in PGY1 and PGY2, trainees in Track 2 will likely fulfill ABFM training requirements sooner than Track 1 trainees, but may have a slight disadvantage on research training during the beginning, and thus may require ramp-up time.

Approach for Integrated Longitudinal Research Training

Mentoring

The research training plan should demonstrate regular mentoring and reviews. Regular interaction between research mentor and trainee is imperative to the success of this pathway, and should occur at a frequency to be individualized to the needs of the trainee, ideally weekly in the beginning. The mentor, working with the program director, must ensure:

- Access to research databases and patient populations to study

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- Opportunities for the study of emerging topics important to family medicine
- Synergies among faculty and trainees through participation in seminars and workshops, and through annual meetings (such as at NAPCRG)

Beginning in PGY1, trainees will work with their residency program director and research mentor to design an individual development plan (IDP), updated annually, that will provide both an adequate clinical experience to meet ABFM's board-certification requirements and an adequate structured research training experience.

Mentoring should culminate in the selection of a content and methodological focus by PGY3. By the summer of PGY3, each trainee should develop a research plan that includes:

- Summary of the research project
- Background or rationale, and significance of the proposed topic
- Primary care relevance and innovation
- Approach and timeline
- Mentor and mentoring plan
- Planned intellectual products (publication and grant applications)
- Career development and institutional commitment
- Graduate degree coursework, particularly electives planned to fill gaps in the core courses

*Entrustable Professional Activities (EPAs) Suggested for the FM-PSP (*indicates required elements)*

The following is a list of suggested EPAs for the *FM-PSP* specific to the research components:

1. Demonstrate knowledge in the synthesis and dissemination of evidence for health promotion, disease prevention, diagnosis, and treatment of individuals and their families in family medicine practices across the lifespan.*
2. Generate testable hypotheses relevant to the care of patients in family medicine and community settings*
3. Lead a rigorously designed research study or scholarly pursuit on topics relevant to the care of patients or the design of care delivery in family medicine settings.
4. Query and analyze data repositories/warehouses, survey or electronic medical records data to inform population health management strategies and/or answer research questions.*
5. Develop competitive grant applications for funding from foundation and federal sources.*
6. Lead or collaborate in the development and publication of peer-reviewed high impact papers.*
7. Lead research teams in developing a family medicine program of inquiry using a variety of designs.
8. Disseminate and/or implement new scientific evidence that is relevant for clinical practice or community health.*
9. Demonstrate awareness of issues related to patient privacy and the responsible conduct of research.*

Criteria for Quality in the FM-PSP

The quality of a training program in the *FM-PSP* will be evaluated on the basis of:

- Preparing trainees on the EPAs
- Providing in-depth knowledge of research methods for research questions across the care continuum and from newborn to adults and end-of-life.
- Providing intensive, supervised research experience resulting in first author publications with mentors who have active research or scholarly programs
- Developing a body of work needed to secure competitive research funding from a variety of sources

The training will be tailored to the needs of the trainees and departments, and programs may draw on resources in their/partner institutions. Core contents of the training will include research design, implementation, analysis and dissemination, presentation skills, responsible conduct of research, implementation science, and population health methods. Others includes criteria of authorship, scientific integrity, participation in team science and active participation in regularly scheduled research seminars, journal clubs, laboratory meetings and formal course work.

Table 3. Components and Outcomes for Key Research Competencies

The ABFM Family Medicine Physician-Scientist Pathway of Research Training in Residency

Research Requirements	Outcomes (demonstrate understanding)
Epidemiology	Basic and intermediate epidemiology and public health principles including study design
Biostatistics	Basic and intermediate biostatistics
Mixed methods research	Integrate qualitative/inductive research with quantitative data
Population health/ Implementation science	Principles of population health management, implementation science, and stakeholder engagement
Data Management	Understand data sources, types, structure, cleaning and creation of analytic cross-sectional and panel data. Demonstrate understanding of at least one statistical software package
Thesis research	Project or study design including reproducibility, and rigor. Full research project development and presentation, including power and sample size, IRB approval and timeline
Scientific writing	Understanding the key elements of competitive proposal/participate in a mock study section
Scientific integrity	Ethical conduct of research/bioethics, and principles of authorship
RCR	Obtain human subjects research certification such as the CITI program
Publications and presentations	Thesis defense, publish or copublish research paper(s) with additional credit given for oral or poster presentations at national or international scientific meetings, and honors and awards for research quality, such as best paper or papers in top-tier journals.

Trainees are expected to generate new scientific knowledge as part of a structured program that leads to peer-reviewed publications and competitive research funding. A research competency committee will monitor and confirm performance based on core elements of research quality (*Table 3*).

Completion of the Research Pathway

Research training usually involves non-structured work during and outside of normal duty hours. There are no specific examinations for the research training, only certification that the candidate satisfactorily completed the required training in the program. However, completion of a graduate degree can be used as an indicator of completion of the program. In addition, the following are required:

1. Current HIPAA (Health Insurance Portability and Accountability Act) training certification
2. Human Subject Training (such as the CITI program certification in all five years)
3. Individual Development Plans (IDP) for each year
4. Attendance at research seminars, home or virtual sessions (25 sessions)
5. Bioethics training (4 sessions/8 total hours)
6. Written research protocol with IRB approval or exemption
7. Research proposal presentation
8. Thesis defense and award of degree, where applicable

Requirement for a Graduate Degree: Residents in the program will be required to take coursework that leads to the award of a graduate degree in primary care related areas such as health policy, population health, public health, or related fields. Ideally, graduate degree coursework should be started in PGY3. The contents should be tailored to the unique needs of the trainee, but a minimum of 14 credits are required for completion of the research training (*Table 1*). Six to eight of the credits can be satisfied through core courses in a Master Degree program, and 4-5 credits from the thesis research. Epidemiology, biostatistics, qualitative research, and population health/community health should be required courses irrespective of the concentration or focus. Trainees who previously completed an MPH or similar degree may test out of this requirement by demonstrating competence in the core curriculum of the graduate program of the particular institution.

Certification Examination in Family Medicine

The criteria for ABFM certification are the same for all candidates whether they pursue the research pathway or standard family medicine training. Trainees in the research pathway may apply for certification when all training and ABFM resident entry requirements have been met. At the least, this will include 24 months of clinical training in family medicine and 36 months of research training with attainment and documentation that the trainee has met the 1,650 continuity patient encounter requirement.

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Minimum Training Requirement in the Family Medicine Research Pathway			
FM Clinical Training	Research Training	Total Training	Exam Administration Eligibility
24 months	36 months	60 months/5 years	Summer, PGY5

- Family medicine training requires 20 months of direct patient responsibility, which may be intermittent or block time; Ambulatory clinics during research training (10%) ½ day per week minimum

Selection of Sites for the Program

The program is anticipated to launch in 2019 and will be limited to institutions with the resources and infrastructure to meet standards for success. Institutions participating in the pilot must demonstrate an established program of research, institutional commitment for research programs, and an energized pool of productive researchers to serve as formal mentors. The mentor should be a productive investigator with a sustained record of competitive research funding and an active research program. Pilot institutions will apply for ABFM approval as a research track training site similar to the process currently used to approve combined training programs.

Program Oversight

During the pilot, a trans-institutional committee will be established (as a steering committee) to guide the training program, monitor progress and quality of the training components, as well as ensure adequate opportunities for professional development among trainees. The steering Committee may include other stakeholders including the ABFM and funders, where appropriate.

Future FM-PSP Development

After the initial five-year pilot and subject to ABFM approval, the *FM-PSP* is envisioned to expand research training opportunities through a consortium of institutions (e.g. virtual multi-site learning) and include exposure to less-resourced sites (e.g. FQHCs) to provide diverse learning experiences and a larger national presence.

Evaluation Components

Institutions participating in the pilot program will track and report on outcomes. Programs will annually report specific successes and challenges, including recruitment, retention, research focus, formalized mentorships, and other measures to a coordinating center, which will in turn report to the ABFM and a steering committee. Given the five-year timeline, the pilot pathway will not receive comprehensive evaluation until 2024. The evaluation will be performed by representatives from key stakeholder organizations (ADFM, NAPCRG, AFMRD, and STFM). The report of the evaluation along with recommendations on continuation or expansion will be submitted to the ABFM. The overall assessment will include recruitment, retention, and program completion rate, trainee career choices, peer reviewed publications, funded grants, and honors for research quality. Some specific program evaluation components include:

- The IDP for trainees that outlines clear learning objectives, what if scenarios, deliverables, and mentoring/training roadmap
- Trainees' levels of achievement, including completion of core training components, research study design, active participation in research seminars, journal clubs, and presentations
- Number and quality of the publications including co-publishing with other trainees, awards in competitive fellowships, and grants as principal investigator or co-principal investigator
- Milestones achieved in completing coursework towards a graduate degree
- Mentorship that provides structured assessment and constructive feedback, and documenting the trainee's research progress and performance
- Institutional sponsors that help provide access to resources and act as a champion for the program/trainee
- A carefully chosen mentoring committee established to track progress on both the research and clinical training, and provide additional scientific input into the trainees' research
- Diversity in the trainees

Implementation Roadmap

The ABFM Family Medicine Physician-Scientist Pathway of Research Training in Residency

- September 28 – Concept approved by the ADFM Building Research Capacity working group
- October 4, 2016 – Concept approved by the ADFM Research Development Committee
- November 11, 2016 – Concept reviewed by the ADFM Board
- January 20, 2017 – Concept reviewed with the ABFM President and CEO and leadership team and feedback provided to clarify ability to on-ramp and off-ramp at various points
- February 2017 – Pilot reviewed at ABFM Winter Meeting
 - Based on feedback, pilots will be limited to departments with the resources and develop stakeholder engagement once approved by the ABFM:
- October 2017 – Pilot approved by ABFM Board of Directors
- Dissemination plan:
 - November 2017: Program post on ADFM and ABFM websites
 - November 2017: Commentary in Annals of Family Medicine
 - Winter 2017- Spring 2018:
 - Identify participating sites
 - Identify champions at each interested department
 - Spring 2018
 - Present pilot to Chairs, Program Directors, Research Directors, and Clerkship Directors at professional meetings particularly at STFM, NACRG and ADFM.
 - Develop pre-interview questionnaire
 - Ongoing: Present plan to funders NIH (R38/T32), AHRQ, RWJF, PCORI
 - Spring 2018: Direct marketing or awareness campaign to medical schools and training programs
 - Direct emailing or through clerkship directors (AAMC CiM/CI)
- January 2018: Identified institutions apply to ABFM for approval
- June 2018: ABFM completes review and approval of applicant institutions
- Launch 2019 MATCH

Working Group on Resident Research Pathway

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Other Stakeholders Involved in Developing the Proposal

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