ARTICLE

Pathways/Mentorship

Mentoring for the Diverse Range of Family Physicians' Engagement in Research

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Primary care researchers are increasingly at the forefront of developing innovations and new research methods to address complex issues in health care, including multi-morbidity, social determinants of health, health equity, managing population health in clinical practice, patient satisfaction, and provider burnout. Research demonstrates that "primary care is the only health care component where an increased supply is associated with better population health and more equitable outcomes."[1] As a primary care specialty, family medicine has evolved beyond its initial focus on clinical practice and education to realizing the imperative for the discipline to robustly engage in research and embrace the responsibility to generate the evidence that drives changes in primary care practice and policy.[2] The primary care clinic is increasingly seen as a complement to medical school laboratories as a powerful site for developing new evidenced-based medicine, and essential for translating new clinical knowledge into practice. Practice-Based Research Networks (PBRNs) comprising primary care clinicians working in the "real world" of clinics promise to bridge "the gaps between communities, funders and policy makers"[3] and the National Institutes of Health has shown increased interest in strengthening Clinical Translational Science Awardees' collaborations with PBRNs.[4] Despite primary care's proven ability to deliver improved outcomes at a lower cost, not enough family physicians are currently engaging in research to improve practice and inform policy. This commentary attempts to describe the wide range of family physicians' intensity of involvement in primary care research and the prospects of mentoring for these needs. (J Am Board Fam Med 2024;37:S69–S74.)

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A Family Medicine Interdisciplinary Research "Ecosystem"

To realize the full potential of family medicine research, the discipline needs to grow and sustain a vibrant interdisciplinary research ecosystem. Together with an appropriate administrative infrastructure and a family medicine culture of inquiry that encourages and rewards research, this research ecosystem would have roles for a broad range of clinical and social sciences professionals and researchers as well as policy experts, patients, and community members. Their contributions to family medicine research would range from the full-time engagement of PhD-trained researchers and physician-scientists to various levels of effort of family physicians and other clinicians, whose day-to-day immersion in clinical practice would inform and enhance the design, implementation, and interpretation of primary care research. As demonstrated by successful Practice-Based Research Networks (PBRNs), this interdependent, interdisciplinary collaboration between researchers and clinicians is critical for the

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effective translation of new clinical knowledge into practice. The interdisciplinary ecosystem would also include patients and community members, whose lived experiences of the social determinants of health provide essential data to inform study questions and advance health equity.[5–9]

While there are many roles envisioned in this ecosystem, this commentary focuses on family physicians and trainees who desire meaningful research engagement complementing their clinical practice, not research-intensive careers. We identify some of the gaps in training and needs for research mentoring through programs that differ from those specifically designed for physician-scientists. Adapting the lessons of research-focused development programs, we pose ideas for research mentoring experiences that support family physicians at different levels of engagement, build a culture of curiosity, incorporate approaches of team science and dissemination and implementation science, and strengthen the diversity of family medicine research.

Family Physicians Inhabit a Continuum of Research Engagement

Research engagement among family physicians and trainees forms a continuum, with one end populated by a small number of research-trained physician-scientists. Along the continuum are clinical faculty engaged in implementing clinical trials or educational research, community physicians participating in PBRNs, and trainees completing scholarly and quality improvement projects with residency faculty.[10] Research activity encompasses unfunded scholarship, small intramurally-funded pilot studies, and large extramurally-funded research programs. Levels of family physician engagement range from recruiting patients and consulting on discrete aspects of a study, to leading a project as site or principal investigator, to leading a large interdisciplinary research program. Collectively, this activity produces research and scholarship disseminated through conference presentations and posters, peer-reviewed journal articles, and technical reports. There are well established programs for preparing physicians for research-intensive careers, such as research fellowships and National Institutes of Health (NIH) career development awards, to meet the rapidly growing need for physician-scientists to serve in principal investigator roles.[11,12] Far fewer programs are available for family physicians who want to meaningfully engage in research without dedicating a majority of their effort to a research career or desiring to lead funded research pro-grams.

Research Mentoring for Academic Family Physician Faculty

Larger academic family medicine departments with robust research infrastructure commonly include research units or divisions incorporating family medicine-relevant disciplines, such as behavioral science and public health, and are often led by PhD-trained faculty whose primary activities focus on extramurally funded research.[13] These family medicine departments can leverage their research expertise and infrastructure to develop an interdisciplinary team-science approach that aligns research mentoring with the needs of clinical faculty and their trainees to gain basic research skills and produce scholarly work required for academic promotion. Pairing research faculty with physician faculty in an organized mentoring structure that attunes research mentors to the specific needs of clinicians is one way to develop family physician research skills. Ideally, research mentoring provided by a researcher with subject expertise is combined with the provision of dedicated research time (ie, funded research effort), staff support (eg, biostatisticians, research administrators), accountability measures and milestones (eg, writing timelines, outcome reports), research funds (eg, for data collection, publication fees), and research-focused career development (eg, grant writing workshops, dissemination strategies). Programs aimed at developing physician-scientists, with the requirement that they dedicate substantial effort to research, could be modified (eg, longer timelines, less dedicated research effort) for family physicians not seeking a research-intensive career. Research mentors could prepare family physicians to leverage and use institutional research training programs and resources, such as those offered through Clinical and Translational Science Awardees (CTSAs), and internal pilot funding opportunities. The North American Primary Care Research Group's (NAPCRG) Grant Generating Project[14–16] and the Association of Departments of Family Medicine's (ADFM) Building Research Capacity Fellowship[17] are other resources providing research mentoring. An additional approach for

academic departments to increase research and research mentoring is to install an infrastructure and processes to intentionally and systematically encourage a culture of curiosity and integrate research and clinical innovation activities into patient care and teaching missions, thereby expanding research and scholarship opportunities for all faculty.[18]

To diversify family medicine research, departments can also leverage federally sponsored programs designed to increase the participation in research of faculty underrepresented in medicine, for example, National Institutes of Health (NIH) Research Supplements to Promote Diversity in Health-Related Research ("diversity supplements") that build on existing NIH awards. Resources to build research mentoring expertise include the NIH National Research Mentoring Network (NRMN), a training hub for research mentoring across the career spectrum to increase diversity in biomedical research.[19,20] Culturally Aware Mentoring, developed in connection with NRMN, is a specific curriculum designed to increase research mentors' skills in recognizing cultural differences and to teach effective approaches that promote inclusive practices in research.[21]

Research Mentoring for Clinically and Education-Focused Faculty

Many family physician faculty in departments without a designated research unit spend most of their effort in direct patient care and clinical education. Their interest in research participation typically aligns with research directly applicable to clinical practice and/or teaching. Through educational research, family physicians shape the discipline's training content, methods, and goals.[22] Recognizing faculty barriers to conducting medical education research (eg, education research skills, dedicated research time, funding, and mentoring[23]), medical schools and professional societies have developed programs to train and mentor medical education researchers.[24] The Society of Teachers of Family Medicine's (STFM) Faculty Skills Course[25] trains family physicians in skills for academic success, for example, teaching methods, academic writing. This STFM faculty development program could be expanded to include training in clinically focused pedagogical research skills for those family physicians interested in educational research.

There is significant opportunity for departments without designated research units to grow clinical research capacity in addition to medical educational research. Increasingly, federal agencies such as the Agency for Health care Research and Quality (AHRQ) and NIH's National Center for Advancing Translational Science support the implementation of translational research findings into active practice.[26,27] In addition, funders' growing emphasis on health equity, community-engaged research[28–30] and interest in technology use in primary care offer more opportunities for family physicians to participate in research.[31] Dissemination and Implementation (D&I) science and clinical translational research, health equity research, and community-based research have in common a team science approach that succeeds through interdisciplinary collaboration. The clinical expertise of family physicians and their experience with diverse communities and the impacts of the social determinants of health make them ideal partners for team science, and projects focused on primary care or community-engaged research, even if they lack formal research training. Collaborators from more research-intensive disciplines, such as public health, social sciences, or clinical specialties, may serve as research mentors or peer mentors to family physicians within the context of team science. Family physicians can contribute to clinical translational research and fill roles in family medicine research as consultants providing subject matter expertise, as study medical directors or site principal investigators for clinical trials, or as hypothesis generators, research incubators, and practice transformation facilitators through their participation in PBRNs. The National Research Network (NRN)[32] is an example of the American Academy of Family Physicians' (AAFP) efforts to make research participation by clinically-focused family physicians more accessible and effective.

Research Mentoring for Community Family Physicians

With a focus on delivering high-quality and efficient primary care, community family physicians harness real-world experience to inform patient-centered research. Driven by their motivation to improve care for patients, community physicians can make excellent research partners and should be

recruited and mentored to help develop and test solutions to some of the most common and vexing primary care problems. Since community family physicians typically dedicate most of their work effort to direct patient care, research training and mentoring programs must tightly focus on the core concepts and skills that are most applicable to practice-based research and fit within the demands of clinical practice. The PBRN research facilitation infrastructure can provide family physicians (and their practice staff) with just-in-time nuggets of professional development in research concepts and skills most relevant to the research study in which their practice participates and offers potential for longitudinal research mentoring.

Dissemination and Implementation Science and Interdisciplinary Team Science

Still in its relative infancy and defining its applied and theoretical foci, the new field of dissemination and implementation (D&I) science responds to the need to accelerate the translation of clinical research findings into everyday practice.[33] Since many patients receive their care first and foremost in primary care, family physicians are well positioned to significantly contribute to D&I research to improve the translation of new clinical knowledge into primary care practice.[34] Incorporating key aspects of D&I science into family medicine research training and mentoring is likely warranted, although at this point, growing D&I training resources developed by CTSAs are predominately aimed at research-intensive faculty and trainees.[35]

As interprofessional team-based care is increasingly the norm in primary care practice, team science is also highly relevant in family medicine research. Promoting interdisciplinary team science through collaborations and partnerships between family physicians and professional researchers in primary care, specialty disciplines, and the social and behavioral sciences is an exciting avenue for family physician researchers at all levels of research engagement to contribute to solving society's grand challenges. Existing research-related organizations, for example, PBRNs, CTSAs, NAPCRG, and state and national academies of family physicians, can be a good resource for training and mentorship in team science.

Culture of Curiosity for Residents and Medical Students

Efforts to increase family physician research engagement must include medical students and residents. Promoting a culture of curiosity and scholarship is essential in demonstrating family medicine is an academic as well as clinical discipline whose members are engaged with discovering new knowledge throughout their professional lives. Educating learners typically begins with building competence in assessing research literature, and this can stimulate interest in research and in developing research skills. Medical school primary care scholarly concentrations and student research programs can provide infrastructure to cultivate a culture of curiosity, while longitudinal mentoring across residency can guide trainees on the path to becoming future physician-scientists. Family Medicine Residency training now mandates the completion of scholarly projects, including a quality improvement project. This is one entry-point to familiarizing future clinically-focused family physicians to concepts and methods of research and to encourage research participation. As the discipline works to build the robust research capability that family medicine both needs and deserves,[2] the Accreditation Council for Graduate Medical Education and the Family Medicine Review Committee play critical roles in setting program standards and requirements that encourage a research-friendly culture in family medicine residency training. This can plant the seeds that research engagement by family physicians who are not research intensive is still critical to improving primary care, for example, through PBRN participation. These governing bodies provide the minimum standards and the justification for the resources and faculty development required to support both faculty and resident research engagement.

Recommendations and a Call for Expanded Models of Research Mentoring

Research mentoring is essential across the full continuum of family physician research engagement and should be intentional, proactive, and aligned with the family physician's interests.[36] For family physicians with an expressed interest in research, we recommend taking greater advantage of existing research development resources, particularly pathways toward becoming physician-scientists. Awareness and promotion of the available

opportunities for faculty (eg, NAPCRG's Building Research Capacity, NIH K-series awards, CTSAs) can increase visibility and spark new faculty interest. At the same time, and for the majority of family physicians who wish to engage with research to a lesser degree, we must expand research mentoring resources beyond the current concentration on physician-scientist development. We suggest developing research mentoring programs specifically aimed at family physicians who wish to participate in research so it complements their clinical practice and matching them with research mentors who can meet them at their level of engagement. Practice facilitators are a potential resource for mentoring in the practicalities of implementing new research knowledge.[37] National networks can and should facilitate these relationships (eg, NRMN, NAPCRG). For academic family physicians, research mentoring should be integrated with career mentoring if promotion is tied to scholarly writing and bibliographic products.[21] Similarly, national family medicine organizations (eg, NAPCRG, AAFP, STFM, ADFM) must supplement their focus on growing family medicine research and advocating for primary care research funding, with sponsoring research mentoring and learning collaboratives for the continuum of research engagement, training department leaders in nurturing research-friendly department cultures, building mentoring infrastructures, and stimulating national dialog that promotes the role of family medicine in D&I and team science as well as advancing primary care.

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