Any family physicians believe that clinical research can only be performed by professional researchers and that clinical research is beyond the expertise of the classically trained family physician. This paper seeks to show that increasing research productivity can be achieved through implementing a research curriculum that supports a culture of inquiry and experimentation and encourages resident-run research.

Multiple studies describe the relatively limited research output by family medicine residents and faculty members and the numerous barriers that make producing research difficult. Publications on actual solutions have been scarce and focus primarily on interventions driven by faculty and singular changes to promote research. To date, there is no published data on approaching limited resident research output using a resident-driven solution. We report on using residents as one part of a comprehensive approach to increasing resident research output that can be adapted by any program.

Methods

Prior to 2010, residents of the Naval Hospital Jacksonville's Family Medicine Residency Program were required to complete a scholarly activity to graduate. This was loosely defined and included work from process improvement projects to Institutional Review Board (IRB)-approved studies. Each resident was given 1 research month of half clinic days during their senior year. There was no formal research training and no formal faculty dedicated to facilitating research. A comprehensive revision of our approach to research was undertaken in 2010. The educational interventions were rolled out in three parts over a 2-year period.

Part One

A faculty research coordinator (FRC) was established. Her background was as a family physician who became interested in research through...
her further studies obtaining a Master’s degree in public health. At the time of her hiring, she had conducted one IRB-approved research project (her Master’s thesis) and had no peer-reviewed author credits. What she lacked in formal research training and outcome was made up in what we have found to be the most critical elements of success: motivation and perseverance. Her primary responsibilities remained as a faculty member of the family medicine resident program. She was given 1 half day per week to focus on resident research.

Her role was in three main parts. First, she enabled the program director to create and foster interdepartmental discussion on research and acted as a liaison with research faculty at other institutions. This was done by direct contact in formal and informal settings. Informally, she approached members of other departments with whom she interacted in the course of her role as a faculty member; literally, she added, “Did you know your family medicine residents conduct research projects?” when speaking with them. Formally, she contacted the chairs of each department, letting them know that the family medicine residents who rotated through their clinics engaged in scholarly research and were open to engaging in joint projects with other departments. She further made a point of engaging members of other departments during Grand Rounds, Morbidity and Mortality, and morning report presentations; when a specialist in our hospital mentioned that their case or clinical question warranted evaluation, our FRC offered to find a family medicine resident willing to help. She interacted with research faculty at other institutions by direct contact; she found contacts from local family medicine residency programs through the Internet and called them. She asked for input on what they were doing for research and offered to facilitate collaboration between their programs and ours.

Second, the FRC enacted a research tracking system that allowed her to follow residents’ progress and determine which were in need of further assistance. This took the form of a simple Gantt chart (see Table 1). Each resident (and interested faculty) had their own chart; the FRC maintained a master chart for tracking all projects.

Finally, she identified local, regional, and national meetings at which research could be presented. This was done through asking colleagues and Internet searches. A chart of presentation venues that included themes, topics of preferred acceptance, and submission deadlines was maintained and used to match research projects with presentation venues.

Part Two

A scholarly activity point system was adapted from one published by Seehusen et al. To further incentivize research, a research award was created and is given at graduation to the resident with the greatest number of accumulated research points. The requirement for scholarly activity to graduate did not change, but the scholarly point system (see Table 2) codified activity and defined a point total that identified sufficient output.

<table>
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<th>Project</th>
<th>Authors</th>
<th>Draft IRB</th>
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<th>Final Edits</th>
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<th>Collect Data</th>
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IRB—Institutional Review Board
BCA—Body Composition Assessment

Part Three

A resident research coordinator (RRC) position was created. This position was filled by a resident who had an interest in research and a desire to teach other residents how to meet their point goals. He had a background in research from a high school mentorship program, undergraduate research, and medical school. He came to residency with some coauthorship in peer-reviewed journals, no IRB experience, and no advanced research degree or thesis experience. His motivation was a belief that primary care research is an essential component of being a practicing physician and a gateway to greater acceptance of primary care in research-driven academia. He acted in this capacity for 1 year and then turned over to another resident who had experience with undergraduate research, no peer-reviewed authorship, and no IRB experience but was also motivated to promote primary care research. The RRC position is granted 1 half day per month to support resident research.

The RRC coordinated an annual case report workshop adapted from McCarthy et al’s “How to Write a Case Report”. This workshop is given in August to all residents, rotating medical students, and interested faculty. It is a half-day interactive session (our program has 1 half day per week for didactics; this session replaced one of those half days) that consists of a brief didactic on the importance of primary care research and methods of primary care research and is followed by an interactive workshop on how to write a case report. This workshop and the scholarly point system were the only...
curricular changes made. Residents continue to have 1 research month of half clinic days in their senior year.

The RRC reviewed rough drafts; offered suggestions for projects, collaborators, and presentation venues; and helped residents apply to local, regional, and national meetings. He discussed career goals and research opinions with the residents and helped them locate faculty with similar interests. He did this with no prior training and no special insight; he simply asked everyone he met what they were interested in and how residents might achieve their stated goals.

The FRC received no extra monetary compensation for her role; her half day per week out of clinical and faculty duties were absorbed by the remaining faculty. The RRC received no monetary compensation for his role.

IRB approval was obtained to study the association between implementation of this series of curriculum initiatives and changes in scholarly productivity and participation.

Results

Part of the challenge of studying research output is in defining what constitutes “scholarly research.” We prefer to leave that term intentionally vague—any research can be a gateway to improvement. Instead, we track “quality projects,” which we define as projects that result in a poster or presentation at a regional or higher-level conference or a peer-reviewed journal publication. This lack of definition also challenges comparisons to other interventions. As a baseline of improved outcomes with interventions, we use Seehusen et al’s results in their report on outcomes after implementing a point system for resident research activity.8 Their research activity increased from 0.13 to 0.94. Their research participation remained low at seven of 18 residents.

For the 3 years prior to the roll out of these educational interventions, six quality projects were produced. The mean number of quality projects per resident per year was 0.07, and the mean number of residents who participated in quality projects was two per year. Two IRB-approved research projects were submitted during this time.

One year after complete roll out, quality project per resident increased to 0.91, with quality projects developed by 26 of 36 residents. This represents a 13-fold increase in research activity and a seven-fold increase in participation. (See Figures 1 and 2.)

Projects started after roll out include case reports, retrospective clinical analysis, literature reviews, prospective clinical trials, process improvement projects, and health care policy articles. Seven IRB projects were submitted, representing a 3.5-fold increase over the previous 3 years. These projects have been presented at local, regional, and

Table 2: Scholarly Point System

| Completion of an IRB-approved research project or a publishable well-conducted process improvement project | 10 |
| Acceptance of a manuscript describing a case report, clinical review, or research project in a peer-reviewed medical journal | 8 |
| Acceptance for publication of an FPIN Clinical Inquiry | 7 |
| Submission, acceptance, and presentation of a podium or poster presentation at a regional, national, or international medical conference for a case report or original research | 6 |
| Acceptance for publication of an FPIN Help Desk Answer or EMedRef | 5 |
| Submission without acceptance of a manuscript describing a case report, clinical review, or research project in a peer-reviewed medical journal | 5 |
| Acceptance for publication of a letter to the editor in a peer-reviewed journal | 3 |
| Being recognized at a local, regional, national, or international conference | 3 |
| Publications for lay public such as newspaper or magazine articles on medical topics | 2 |
| Presentation of scholarly activity at the JFMRP Annual Academic Scholarship Day | 2 |
| Presentation of a Grand Rounds/TIMM conference to the hospital staff | 1 |
| Submission without acceptance of a presentation at a regional, national, or international conference | 1 |
| Presentation of case at Tumor Board | 1 |
| Completion of CITI/IRB training | 1 |

IRB—Institutional Review Board
FPIN—Family Physicians Inquiries Network
JFMRP—Jacksonville Family Medicine Residency Program
TIMM—Tumor Inquiry/Morbidity and Mortality
CITI—Collaborative Institutional Training Initiative
Discussion
Our analysis reveals a positive association between scholarly activity production and resident participation in research and our curricular initiatives. Some of these curriculum changes have been described in other literature, such as a faculty research coordinator and a research point system.7,10

The novel component of our approach is the creation of the resident research coordinator. An extensive literature search resulted in no references of this intervention being attempted. The greatest increase in research participation occurred after this position was filled, and for this reason we consider the resident research coordinator position to be the lynchpin for creating a culture of research and innovation.

We are confident that the RRC position may be generalized to other programs. This confidence stems from two observations. First, neither of our RRCs had greater formal research training than any other medical school graduate. They had both been involved in undergraduate research but were not researchers from other fields who became physicians. Second, our research productivity continued to increase after the original RRC turned over to his replacement—the functions served by the RRC appear to be more important.
than the person performing them. The key traits of our RRCs were motivation and perseverance; we believe that any resident with those traits in abundance will be able to achieve similar results.

This study is limited by reliance on the accuracy of past records and a small sample size of a single residency program. We are also unable to precisely parse the impact of each component of our changes or determine if specific members of the residency program drove this change. Future research into this curriculum at other residencies would be beneficial.

Conclusions
In an effort to help residents meet ACGME research obligations, curriculum changes were implemented at Naval Hospital Jacksonville. These changes were associated with increased research production and participation. These changes incurred no increased cost to the program and are relatively simple to implement. We believe similar curriculum changes could help other residencies meet their goals.

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References
1. Hueston WJ. Research activity in family medicine: the “best of times” or “can I have more, please?” J Am Board Fam Med 2008;21(1):4-5.