

Meeting Resident Scholarly Activity Requirements Through a Longitudinal Quality Improvement Curriculum

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Abstract

Background Quality improvement (QI) skills are learned during residency, yet there are few reports of the scholarly activity outcomes of a QI curriculum in a primary care program.

Intervention We examined whether scholarly activity can result from a longitudinal, experiential QI curriculum that involves residents, clinic staff, and faculty.

Methods The University of Pittsburgh Medical Center Shadyside Family Medicine Residency implemented a required longitudinal outpatient practice improvement rotation (LOPIR) curriculum in 2005. The rotation format includes weekly multidisciplinary work group meetings alternating with resident presentations delivered to the entire program. Residents present the results of a literature review and provide 2 interim project updates to the residency. A completed individual project is required for residency graduation, with project results presented at Residency Research Day. Scholarly activity

outcomes of the curriculum were analyzed using descriptive statistics.

Results As of 2014, 60 residents completed 3 years of the LOPIR curriculum. All residents satisfied the 2014 Accreditation Council for Graduate Medical Education (ACGME) scholarly activity and QI requirements with a literature review presentation in postgraduate year 2, and the presentation of a completed QI project at Residency Research Day. Residents have delivered 83 local presentations, 13 state/regional presentations, and 2 national presentations. Residents received 7 awards for QI posters, as well as 3 grants totaling \$21,639. The educational program required no additional curriculum time, few resources, and was acceptable to residents, faculty, and staff.

Conclusions LOPIR is an effective way to meet and exceed the 2014 ACGME scholarly activity requirements for family medicine residents.

Editor's Note: The online version of this article contains a full listing of resident quality improvement scholarly activity from 2006 to 2014.

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Introduction

The Health Resources and Services Administration defines quality improvement (QI) as “systematic and continuous actions that lead to measurable improvement in health care services and the health status of targeted patient groups.”¹ QI activities are relevant to practicing physicians, and have also become priorities for patient-centered medical home recognition, reimbursement systems, and maintenance of board certification.

Primary care residency training programs are challenged to provide opportunities for residents to produce scholarly activity while ensuring rigorous clinical training. The Accreditation Council for Graduate

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Medical Education (ACGME) program requirements for internal medicine and pediatrics state that residents should participate in scholarly activity. The family medicine requirements specify 2 scholarly activities, including 1 QI project.²

QI projects can translate to scholarly activity output. Previous reports have presented the academic output of a curriculum focused on scholarly activity in general, including both research and QI.^{3,4} We examined whether a longitudinal outpatient practice improvement rotation (LOPIR) would produce QI projects that would both fulfill ACGME requirements and result in scholarly activities for family medicine residents.

Methods

The University of Pittsburgh Medical Center Shadyside Family Medicine Residency is an urban, university-affiliated program with 10 residents per postgraduate year (PGY). Two residents per class are in a global health track and do not participate in the LOPIR curriculum. All other residents participate in the LOPIR curriculum throughout 3 years of residency. All faculty, including pharmacy and behavioral health faculty, are required to participate in the LOPIR curriculum, except for 1 faculty member assigned to the global health track.

The curriculum consists of 1 hour of protected time for bimonthly team work group meetings and a half hour of protected time for resident presentations during “Practice Improvement Rounds” (PIRs) on the alternate weeks. Residents are required to attend all work group meetings and PIR sessions except in cases of approved vacation or excused rotations, such as obstetrics (off campus) or night shift (work hour violation). There is not a formal didactic curriculum; rather, residents learn the principles of QI by observing peer project progression in PIRs, participating in the project design of other work group members, and leading their own projects. The FOCUS Plan-Do-Study-Act method is emphasized.⁵ Residents must complete an individual project to meet the graduation requirements of the residency. Dissemination of projects, including presentations at professional meetings and publication, is encouraged but not required.

Work groups are multidisciplinary and are composed of 2 residents per class year, 3 to 4 faculty members, and 1 or 2 family health center staff members. To address variability in faculty QI skills, each group was initially assigned 1 experienced faculty member to model the project mentoring process. All faculty members now are actively involved in teaching QI and mentoring projects within their work groups.

Each work group has a focus based on a chronic disease or a population: diabetes, mental health, women’s

What was known and gap

Primary care residency training programs find it challenging to engage residents in scholarly activity while aiming to maximize clinical training.

What is new

A required longitudinal outpatient practice improvement rotation (LOPIR) curriculum offers residents exposure to the literature and culminates in a scholarly project.

Limitations

Single institution, single specialty study limits generalizability; study design may increase risk of recall bias.

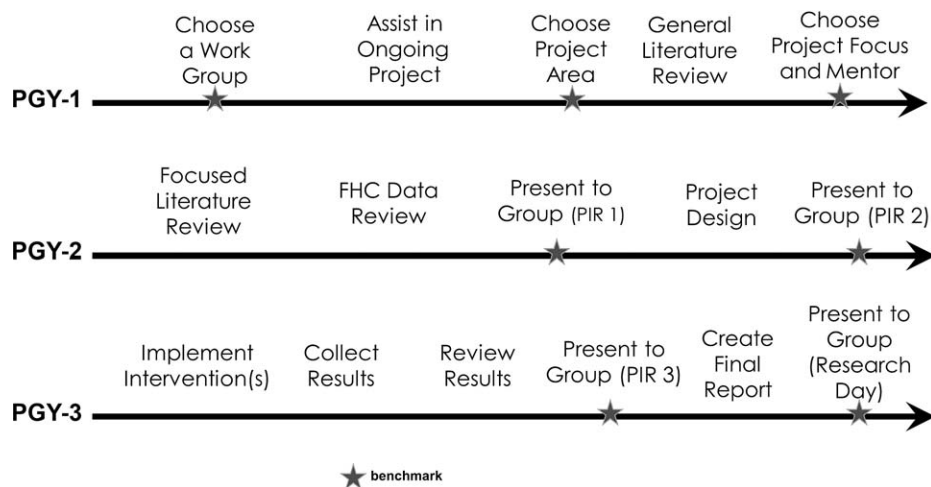
Bottom line

The longitudinal curriculum is an effective way to expose family medicine residents to scholarship.

health, and pediatrics. Each work group develops its own organizational style. During the first 2 months of residency, PGY-1 residents rotate through work group meetings, rank them in order of preference, and are typically assigned to their first or second choice. Each resident remains in the same work group throughout residency in order to provide a continuous experience. In work group meetings, residents discuss project plans, receive feedback on drafts of required presentations, plan and conduct chart reviews, review data on ongoing interventions, and share literature updates. Individual mentoring occurs on an as-needed basis outside of the work group meetings. Although residents have protected time for participation in the curriculum (PIR and work groups), other protected work time is not provided.

PIRs are 3 required, program-wide 15- to 30-minute presentations in which residents share their progress and receive feedback from the residency community. PIR dates rotate among work groups throughout the academic year. Each work group assigns presentation dates based on resident availability and project timeline. The **FIGURE** displays resident progress through the curriculum. PGY-2 residents present 2 PIRs: a literature review (PIR 1) and the proposed QI intervention and baseline data (PIR 2). PGY-3 residents present 1 PIR: an implementation update (PIR 3). All PGY-3 residents present a summary of the project and outcomes at Residency Research Day a month prior to residency graduation. PGY-1 residents do not have a presentation requirement, but they must participate in work group activities and identify a project focus by the end of the academic year.

We revised our didactic teaching schedule from midday hour-long meetings to a weekly 4-hour block to accommodate protected time for work groups and PIRs. This change did not have an impact on the achievement of



FIGURE

LONGITUDINAL OUTPATIENT PRACTICE IMPROVEMENT ROTATION (LOPIR) TASK COMPLETION TIMELINE

Abbreviations: PGY, postgraduate year; FHC, family health center.

required patient encounters. Since implementation, faculty development time has been devoted annually to refining the curriculum. Faculty member work plans were adjusted to allocate 50 hours per year (2% effort) to teaching QI, including time mentoring residents and attendance at LOPIR work groups and PIRs. In 2010, the program director implemented a faculty incentive plan for clinical, academic, and service activities using funds from departmental cost-cutting measures, including withheld faculty salary increases for 1 year and money transferred upon a hospital merger. Academic productivity was based on a point system for various scholarly activities, including mentorship of LOPIR projects and faculty-mentored presentations or posters. In the 2012–2013 academic year, \$89,440 was distributed among 13 faculty members.

Six nonphysician health professionals (nurses, a social worker, an obstetrics nurse educator, a nurse manager) and a full-time data manager commit 20 hours per year to a work group, and they additionally support team-based QI initiatives at the family health center as part of their job descriptions. The data manager also responds to data requests from all work groups. The diabetes and women's health work groups align with regional practice-based research and QI network activities at the health center and benefit from additional data sources. The diabetes work group has 1 AmeriCorps member each year funded by a local foundation grant. The women's health group has a grant-funded graduate student research assistant and practice-based network project coordinator. Residents are encouraged to seek local foundation grant funding for materials related to their projects (eg, a photo screening device).

We compiled a listing of all posters, external presentations, and grants completed by residents between 2006 and 2014, excluding scholarly activity unrelated to the LOPIR curriculum. Presentations at Residency Research Day were counted as local presentations. Literature reviews may count as scholarly activity per the 2012 ACGME scholarly activity guidelines for family medicine⁶; literature review and progress presentations to the residency (PIRs) were not counted. Although residents are required to complete individual projects, some scholarly activities involved several residents who contributed to a poster or presentation as members of a work group. For the proportion of residents exceeding the 2014 family medicine scholarly activity requirements, each resident who exceeded the requirements was counted only once, although an individual resident may have presented in multiple venues. Grants listed are only those obtained by residents to cover the costs of project materials or services.

The University of Pittsburgh Institutional Review Board reviewed this manuscript and determined that further Institutional Review Board review was not required.

Results

In the 9 years between the 2005 implementation and the end of the 2013–2014 academic year, 8 residents completed 1 year of the LOPIR curriculum, 8 residents completed 2 years, and 60 residents completed all 3 years. All residents completed and presented a QI project.

All residency graduates who completed 3 years of the LOPIR curriculum (N = 60) have satisfied the 2014 ACGME scholarly activity requirements with presentation of a literature review in PGY-2 and presentation of a completed QI project at Residency Research Day. A total of

TABLE 1
SCHOLARLY ACTIVITY INVOLVING
RESIDENTS 2006–2014

	No.	Award
Posters	14	
Local (hospital QI fair)	7	6
Regional/state	7	1
Presentations	84	
Local–Residency Research Day	76	
Regional/state	6	
National	2	
Grants	3^a	\$21,639
Total scholarly activity	101	

Abbreviation: QI, quality improvement.

^aTwo grants obtained in 2013 by resident in class of 2015.

37% (22 of 60) of residents who graduated between 2008 and 2014 exceeded the 2014 ACGME scholarly activity requirements. Six residents produced 2 or more presentations exceeding the scholarly activity requirements. Seven poster presentations received awards. TABLE 1 summarizes resident scholarly output, including Residency Research Day and external presentation. TABLE 2 lists examples of resident scholarly activities that exceeded the ACGME requirements, with a complete listing available as online supplemental material.

Discussion

To our knowledge, this is the first report of a curriculum that meets the 2014 ACGME scholarly activity requirement

for family medicine. All residents who completed 3 years of the LOPIR curriculum met the 2014 ACGME requirement of 1 scholarly activity and 1 QI project, with 37% of residents exceeding this requirement through local poster presentations, grant acquisition, or presentations at regional and national meetings.

The scholarly activity outcomes of the LOPIR curriculum compare favorably with the low dissemination rates reported in surveys of family medicine, internal medicine, and pediatrics residency directors.^{7–9} Curricular changes targeting scholarly activity have produced notable increases in output by primary care residents.^{10–14} The curricula were not designed to teach QI and do not report information regarding QI project dissemination. The reported scholarly activity consists of case reports, letters to the editor, literature reviews, and other research projects, which do not meet the 2014 ACGME requirement of a QI project for family medicine residents. Previous reports provide information regarding a curriculum in scholarly activity that has resulted in numerous state, regional, and national presentations, as well as peer-reviewed publications.^{3,4} Unlike the educational intervention described in this paper, which focuses on QI, the previously described curriculum involved both QI and other forms of scholarship.⁴ Although all of our residents met or exceeded the 2014 ACGME scholarly activity requirements, our QI curriculum resulted in no peer reviewed publications and fewer national presentations compared with other published reports of scholarly activity curricula.

The LOPIR curriculum design addressed variable faculty expertise by initially assigning 1 faculty member with QI experience to each work group, but it required no

TABLE 2
EXAMPLES OF RESIDENT SCHOLARLY ACTIVITIES (SAs) 2006–2014^a

Type of SA	Title	Award
Poster	Simasek M, Abeleda A. <i>A Process to Facilitate Autism Screening at the Family Health Center</i> . Poster presented at the 2010 UPMC Presbyterian-Shadyside Quality and Safety Fair, Pittsburgh, Pennsylvania.	2nd place: Quality
Regional poster	Simasek M, Wakai T. <i>EPSDT at the UPMC Shadyside Family Health Center: A Quality Improvement Project</i> . Poster presented at the 2011 Family Medicine Education Consortium, Danvers, Massachusetts.	Top 10 Best Posters
State presentation	Tan L. <i>Prevention of Low Birth Weight and Prematurity</i> . Presented at the 2006 Pennsylvania Academy of Family Physicians Research Day, Philadelphia.	No
National presentation	Bautista J, Phelps P. <i>Anxiety: Comes From Within, Heals From Within</i> . Presented at the 2014 Society of Teachers for Family Medicine Conference, San Antonio, Texas.	No
Local grant	Simasek M, Khan N. <i>Improving the Vision Screening Process in Children at the UPMC Shadyside Family Health Center</i> . Shadyside Foundation grant for \$8,639 for purchase of photo-screening device and printer.	No

Abbreviation: UPMC, University of Pittsburgh Medical Center.

^aNote: For a full listing, see online supplemental material.

additional faculty or staff development. The curriculum provided protected time for QI learning by rearranging the didactic schedule instead of adding additional time in the curriculum, although residents and faculty must budget time outside of work group meetings for literature review, presentation creation, and data analysis.

Other challenges include scheduling PIRs and work group discussions around excused absences. Although presentation requirements ensure that each resident meets targets that lead to project completion, the scheduling of PIRs for any given resident affects the 2-year timeline of the resident's project and does not accommodate rapid-cycle QI. Conference expenses and timing of project completion 1 month prior to graduation are barriers to residents presenting at national conferences and publishing results. Our program currently does not reimburse residents for scholarship-related travel, and all of our state and regional presentations occurred at venues that are within driving distance or where resident costs were covered by the program for recruitment purposes. Despite these challenges, there is a general spirit of enthusiasm for the curriculum and for improving care at the family health center among faculty, residents, and staff.

Our findings are limited by data analysis based on retrospective collection and may have omitted some resident activities. The impact of the faculty incentive program on resident scholarly activity cannot be determined.

To improve scholarly activity output, our program implemented an abstract requirement in 2013, and will further require a poster appropriate for conference presentation from our 2015 graduates. Additional changes may include an earlier project completion deadline and required modules on Institutional Review Board and quality board approval processes.

Conclusion

Our LOPIR is an effective way to meet and exceed the ACGME scholarly activity requirements for family medicine residents. This model might serve other primary care residencies in meeting their scholarly activity requirements through an exclusive QI curriculum.

References

- 1 US Department of Health and Human Services, Health Resources and Services Administration. Quality improvement. 2011. <http://www.hrsa.gov/quality/toolbox/methodology/qualityimprovement/>. Accessed September 19, 2014.
- 2 Accreditation Council for Graduate Medical Education. Specialty-specific references for DIOs: resident/fellow scholarly activity. 2014. https://www.acgme.org/acgmeweb/Portals/o/PDFs/Specialty-specific%20Requirement%20Topics/DIO-Scholarly_Activity_Resident-Fellow.pdf. Accessed September 19, 2014.
- 3 Diaz VA, Carek PJ, Dickerson LM, Steyer TE. Teaching quality improvement in a primary care residency. *Jt Comm J Qual Patient Saf*. 2010;36(10):454–460.
- 4 Carek PJ, Dickerson LM, Diaz VA, Steyer TE. Addressing the scholarly activity requirements for residents: one program's solution. *J Grad Med Educ*. 2011;3(3):379–382.
- 5 Schwarz M, Landis SE, Rowe JE. A team approach to quality improvement. *Fam Pract Manag*. 1999;6(4):25–30.
- 6 Accreditation Council for Graduate Medical Education. Review Committee for Family Medicine scholarly activity guidelines. 2012. http://www.acgme.org/acgmeweb/Portals/o/PFAssets/ProgramResources/120_Family_Medicine_Scholarship_Guidelines.pdf. Accessed November 14, 2014.
- 7 Levine RB, Hebert RS, Wright SM. Resident research and scholarly activity in internal medicine residency training programs. *J Gen Intern Med*. 2005;20(2):155–159.
- 8 Crawford P, Seehusen D. Scholarly activity in family medicine residency programs: a national survey. *Fam Med*. 2011;43(5):311–317.
- 9 Mann KJ, Craig MS, Moses JM. Quality improvement educational practices in pediatric residency programs: survey of pediatric program directors. *Acad Pediatr*. 2014;14(1):23–28.
- 10 Kohlwes RJ, Shunk RL, Avins A, Garber J, Bent S, Shilpak MG. The PRIME curriculum clinical research training during residency. *J Gen Intern Med*. 2006;21(5):506–509.
- 11 Kanna B, Deng C, Erickson SN, Valerio JA, Dimitrov V, Soni A. The research rotation: competency-based structured and novel approach to research training of internal medicine residents. *BMC Med Educ*. 2006;6:52.
- 12 Vinci RJ, Bauchner H, Finkelstein J, Newby PK, Muret-Wagstaff S, Lovejoy FH. Research during residency training: outcome of a senior resident block rotation. *Pediatrics*. 2009;124(4):1126–1134.
- 13 Hoedebecke K, Rerucha C, Runser L. Increase in residency scholarly activity as a result of resident-led initiative. *Fam Med*. 2014;46(4):288–290.
- 14 Lennon RP, Oberhofer AL, Mc Nair V, Keck JW. Curriculum changes to increase research in a family medicine residency program. *Fam Med*. 2014;46(4):294–298.