An Alternative Practice Model: Residents Transform Continuity Clinic and Become Systems Thinkers

Colleen Y. Colbert, PhD
John D. Myers, MD
Christian T. Cable, MD
Paul E. Ogden, MD
Curtis Mirkes, DO
Tresa McNeal, MD
Shawn Skeen, MD

Abstract

Background A changing health care environment has created a need for physicians trained in health system improvement. Residency programs have struggled to teach and assess practice-based learning and improvement and systems-based practice competencies, particularly within ambulatory settings.

Intervention We describe a resident-created and resident-led quality and practice-improvement council in an internal medicine continuity clinic. We conducted focus groups and report on residents' perspectives on council membership, practice management experiences, quality improvement projects, and resident satisfaction.

Method Focus groups were held from May 2009 to March 2010 with internal medicine residents (N = 5/focus group) who participated in the Continuity Clinic Ownership in Resident Education (CCORE) council. Data were analyzed with a grounded theory approach.

Results During the focus groups, residents responded to the question: "Do you have any new insights into delivering quality patient care in an outpatient clinic as a result of this experience (CCORE membership)?" The qualitative analysis resulted in 6 themes: systems thinking and systems-based care skills; improving quality of patient care; improved clinic efficiency; ownership of patients; need for improved communication of practice changes; and a springboard for research.

Conclusions CCORE residents participated in system changes and acquired leadership skills while working on practice-based and system problems in a clinic microsystem. We believe this model can be implemented by other residency programs to promote the development of systems thinking in residents, increase their ownership of continuity clinic, and empower them to implement system changes.

Editor's Note: The online version of this article contains subthemes derived from the qualitative analysis used in this study.

All authors are at Texas A&M University System Health Science Center College of Medicine. **Colleen Y. Colbert, PhD,** is Director of the Office of Medical Education, Evaluation & Research Development, Internal Medicine Department, at Scott & White Healthcare; **John D. Myers, MD,** is Vice Chair for Educational Affairs, Internal Medicine Department, at Scott & White Healthcare; **Christian T. Cable, MD,** is Program Director, Medical Oncology Fellowship Program, at Scott & White Healthcare; **Paul E. Ogden, MD,** is Vice Dean for Academic Affairs; **Curtis Mirkes, DO,** is Program Director of the Internal Medicine Residency Program at Scott & White Healthcare; **Tresa McNeal, MD,** is Associate Program Director of the Internal Medicine Residency Program at Scott & White Healthcare; and **Shawn Skeen, MD,** is Cardiology Fellow at Scott & White Healthcare.

Funding: The authors report no external funding source for this study.

Portions of this article were presented at the Association of Program Directors in Internal Medicine Fall Conference, October 2009; the Association of American Medical Colleges Integrating Quality Conference, Chicago, Illinois, June 2010; the Southern Group on Educational Affairs Conference, Houston, Texas, April 2011; and the International Conference on Residency Education (ICRE), Quebec City, Quebec, Canada, September 2011.

The authors gratefully acknowledge the residents in the CCORE council who shared their experiences with investigators; the current CCORE Chair, Syed Samih Hasan, MD, for clarifying questions; June Lubowinski, MLS, MA, Public Services Librarian, Scott & White Hospital; Gina DuPar, Medical Editor; and Glen Cryer, Manager, Scott & White Publications Office.

Introduction

A changing health care environment has created a need for more physicians trained in providing primary care with a focus on systems of care and improving the health of populations. At the same time, ambulatory experiences do not always offer opportunities to improve practice management or systems-based practice (SBP) skills. Practice-based learning and improvement (PBLI) and SBP have thus been targeted within resident ambulatory clinics at a number of institutions.[1–8]

While formal, faculty-driven quality improvement (QI) curricula and initiatives exist, resident-led initiatives targeting practice management and the broader SBP and PBLI competencies appear to be less common. Our

Corresponding author: Colleen Y. Colbert, PhD, Scott & White Healthcare, Texas A&M University System HSC College of Medicine, Office of Medical Education, Evaluation & Research Development, Department of Internal Medicine, 2401 South 31st Street, Temple, TX 76508, 254.724.8882, cycolbert@swmail.sw.org

Received June 17, 2011; revision received December 29, 2011; accepted January 9, 2012.

DOI: 10.4300/JGME-D-11-00133.1

literature review found 3 descriptive articles related to resident-led councils.[8–10] No study could be found that examined a resident-led council that directed and implemented practice improvement and SBP initiatives.

At Scott & White/Texas A&M Health Science Center College of Medicine (S&W/Texas A&M), internal medicine residents created a resident-led council within resident clinic to provide practice management experiences, initiate quality improvement projects, and improve satisfaction. Through the Continuity Clinic Ownership in Resident Education (CCORE) council, practice improvement and quality initiatives are conceived by residents and implemented within clinic. We describe this educational innovation and report results from a qualitative study examining residents' perspectives on the CCORE council.

What was known

Policy makers have called for primary care physicians who are systems-literate and trained in quality improvement. Many residency programs have struggled to teach and assess these competencies, particularly in the ambulatory setting.

What is new

A resident-created and resident-led council enhanced residents' systems thinking and systems-based care skills, ownership of patients, and improved resident satisfaction. Most important, it improved outcomes in resident practice.

Limitations

Single-site, single-specialty study, and lack of educational and patient care outcomes limit generalizability.

Bottom line

The model of a resident-led council can be implemented by other programs to promote the development of systems thinking in residents, and empower them to implement system changes.

Intervention

All S&W/Texas A&M internal medicine residents (N = 54) attend a weekly outpatient continuity clinic. Residents identified the following priorities: problems with continuity; compliance with medication reconciliation; patient financial concerns; staffing issues; and quality of care, and created the voluntary CCORE council in 2008 with faculty support. Residents are nominated for CCORE membership by chief residents on the basis of leadership within the residency program and interest in primary care. Of 54 internal medicine residents, 9 serve voluntarily on the CCORE council. Membership is limited to 9 with equal representation by year of training, with the goal of creating a small, flexible governing council. CCORE members established bylaws and 3 working groups: practice based, systems based, and QI. Each subgroup was composed of 1 person from each class. CCORE residents met approximately every 1 to 1.5 months in informal work sessions during which they discussed subgroup projects (TABLE 1). Monthly subgroup meetings are not part of the study described below. This qualitative intervention was granted exemption from further oversight by the Institutional Review Board at Scott & White Healthcare.

Qualitative Approach

We used a grounded theory approach[11] to examine resident perspectives about CCORE participation. One-hour focus groups, rather than one-on-one interviews, were chosen owing to scheduling issues and time constraints for residents and the faculty facilitator.

Focus Group Participants

From May 2009 to March 2010, CCORE members voluntarily attended 4 focus groups. A representative from each class was present at each focus group; the average number of residents attending individual focus groups was 5. A total of 12 residents participated in focus groups during the 9-month study period, and all CCORE members attended at least once.

Data Collection

Focus groups were facilitated by one of the authors (C.Y.C.), who had no role in resident grading. Narrative data were collected via digital recorder, and no personal identifiers were recorded. All residents contributed during focus group discussions. Data were transcribed verbatim and saved in a response table. Digital files were saved to a secure electronic drive. Data saturation was reached after 9 months, when similar responses to questions were seen.[12] Data collection was discontinued at that point.

Data Analysis

Data analysis used a multistep, iterative process where investigators continually returned to the data to refine themes and subthemes.[11] Initially, investigators independently reviewed data and identified categories via open coding.[11,13] Investigators met face to face to carry out axial coding, involving the reanalysis, revision, and condensing of categories.[11,14] Investigators held 3 face-to-face meetings to reach consensus on coding and refinement of themes and subthemes. Seven investigators with diverse backgrounds were used to enable investigator triangulation.[15] Conclusions were verified through e-mail and several face-to-face meetings.

Results

Insights Into Delivering Quality Patient Care

Residents were asked: "Do you have any new insights into delivering quality patient care in an outpatient clinic as a

result of this experience (CCORE membership)?'' The qualitative analysis resulted in 6 themes, with exemplars listed below. See APPENDIX A (provided as online supplemental material) for subthemes.

1. *Systems thinking and systems-based care skills.* Residents recognized they work within a clinical microsystem with multiple stakeholders and interrelationships, which is dependent upon interdisciplinary teamwork.

''It's a lot of interdisciplinary teamwork and trying to figure out how the system works from not only our perspective—So getting together, and figuring out what system would be conducive for everybody will make the system smoother. And then really just doing that to figure out the flaws of the entire system, and how that can transcend to the patients, and improve their quality of care.'' *PGY-3 resident*

2. *Improving quality of care.* Residents gained insights into potential barriers to enhancing quality of care in an outpatient setting, including lack of follow-up.

''I think that being on this council has opened my eyes towards the screening of patients, the colonoscopies, and those sorts of things. Making sure that they're getting their maintenance care, in addition to their regular ill visits or whatever they're coming in for.'' *PGY-1 resident*

3. *Improved clinic efficiency.* Residents were able to recognize inefficient aspects of the continuity clinic experience.

''Just efficiency, period, with the clinic set up. Something as simple as giving somebody a flu shot. There's a way that you can make it run smoother in clinic, like when you go check it out, you can give the nurse their sheet, so they know what to do, and then give them the flu shot when they're ready to go.'' *PGY-1 resident*

4. *Ownership of patients.* Seeking improved efficiency and quality of care, residents began to take greater ownership of continuity clinic patients.

''Figuring out those small things like when the labs are arranged, what date they are on, so they (patients) won't get stuck three times and get charged 3 times as well.'' *PGY-3 resident*

5. *Need for improved communication of practice changes.* Residents understood the need to communicate changes back to the entire residency, in order to disseminate and sustain improvements.

''I'm thinking that we lack communicating everything that's going on to the residency as a whole. I think whatever's going on, like what we've learned in clinic, or what we need to talk about, we don't communicate to our program.'' *PGY-3 resident*

6. *Springboard for research.* Residents recognized the usefulness of CCORE data collection in conducting clinical research.

''If you take that one step further, it can be really helpful in clinical research. If we're following, for example, hepatitis symptoms and people have been screened for hepatitis, we can do that, just by our screening that we do in the clinic. We can have our own patient database and do retrospective studies.'' *PGY-1 resident*

New Knowledge and Skills

Residents were asked: ''What are you learning in terms of new knowledge and skills within the CCORE that you do not get elsewhere? How is this experience different from other experiences you have had in residency?'' As a result of the qualitative analysis, 6 themes were identified. Subthemes are listed in APPENDIX B (provided as supplemental online material).

1. *Empowerment of residents.* As a result of CCORE participation, residents felt they had the power to implement changes in resident clinic.

''Seems like there aren't many opportunities for us to kind of take charge as a group of residents. It seems like they are saying, 'This is your baby. Go and do what you think should be done.' Yeah, it's something different.'' *PGY-1 resident*

2. *Practice development and management.* Residents developed new perspectives on clinical practice.

''It allows us to sort of get into the mind-set of practice development. And it also allows us to take ownership of our patients and of the clinic there. That, I think, itself has a lot of utility.'' *PGY-1 resident*

3. *Template to be applied to other areas of residency.* Residents appreciated the CCORE as a template and desired to reproduce it in other areas of the residency.

''I think there should be more of these committees in residency: one for inpatient, one for outpatient, one for subspecialties, so that everyone has a chance to be involved in this program and feel committed that they are working toward a goal…'' *PGY-3 resident*

4. *Improved communication.* Residents saw a link between poor communication and medical errors.

''We realized how many times a mishap happened because of communication between nurses, or how we can improve communication.'' *PGY-2 resident*

5. *Better understanding of clinical microsystem.* Residents learned to analyze problems from multiple perspectives and to understand clinic processes through systems-thinking skills.

''I think we've also learned a lot about the flaws of the system by doing this kind of group. You know, ordering

TABLE **Examples of Continuity Clinic Ownership in Resident Education (CCORE) Subgroup Projects**

Group	Problem or Issue Tasked With	Stakeholders Involved	Action	Outcomes
PB group	Poor resident response to nurse and secretary phone calls.	Residents Nurses Resident clinic secretaries	After meeting with nurses and secretaries, the group established a protocol to simplify the electronic notification procedure.	Complaints about responses to phone calls decreased.
PB group	Residents did not have enough time to spend on complex patient visits. Most patients in resident clinic have multiple comorbidities.	Residents Secretaries Faculty	After working with clinic secretaries, scheduling revised to allow for more continuity-of-care visits for patients.	Residents had more time to spend with each patient. Resident satisfaction with visits improved.
QI group	Residents were not tracking quality parameters for their panels of patients in resident clinic. There was a need for identification of quality parameters for patient panels.	Residents Physicians within specialty services	Residents contacted subspecialties to identify patient goals (ie, A1c monitoring, or vaccinations). They also began sampling of charts to measure quality of care, with incorporation of results into each resident's portfolio.[16]	QI group created reminder sheets for patient files. Reminder sheets were initially attached to all patient files. After implementation, group assessed resident compliance (low) and opted to post QI reminders in visible locations in resident clinic.
SB group	Medication reconciliation issues in resident clinic.	Residents Patients Nurses	Residents implemented use of the electronic medical record for medication reconciliation in resident clinic.	Medication reconciliation enhanced in resident clinic. Process now includes patient input. Outcome: saved time (resident) and greater empowerment of patients.
SB group	Ongoing initiatives include judicious use of phlebotomy to reduce unnecessary patient "sticks" (and costs) for routine laboratory tests.	Residents Patients Phlebotomists	SB group increased awareness of unnecessary patient sticks in resident clinic.	No documented outcomes to date except for heightened awareness of issue.
SB group	Perceived need for greater resident involvement in community health efforts.	Residents Patients at free clinic Members of community organizations Medical students who rotate through free clinic	Residents investigated opportunities for participating in community outreach efforts, including attending health fairs and discussing health topics with community organizations.	Based upon CCORE resident leadership, general internal medicine residents began supervising MS3 students at the Temple Community Free Clinic on Tuesdays and Thursdays.

Abbreviations: A1c, hemoglobin A1c(HbA1c); MS3, third-year medical student; PB, practice based; QI, quality improvement; SB, systems based.

multiple labs, and the inefficiencies in the way we do things. So it's been kind of nice to be able to figure that out, because I don't think we really knew it until we sat down and talked about it." *PGY-3 resident*

6. *Creativity in problem solving*. Residents recognized the utilization and application of a different set of cognitive skills.

"I think one of the things that I've found is that there's a problem-solving type of aspect to it. It's different than the regular medical knowledge that we get on the wards." *PGY-2 resident*

Factors in Resident Satisfaction

Residents were asked: "What impact has the CCORE had on your satisfaction with resident clinic?" With a qualitative analysis, the following 7 themes were generated: empowerment for change; improved morale; being listened to; practice management improvements; unity; efficacy of group; and understanding clinical environment. Empowerment for change was a recurring theme during focus-group sessions.

Feasibility, Resource Utilization, and Sustainability

As there are no start-up costs, this type of governance council is a feasible model for other residency programs. Resident time, the major resource used, has been a limiting factor in terms of productivity (number of projects finished). The council was created by the residents; incentives for involvement have not been deemed necessary. If interest in the council begins to wane, an incentive structure may need to be considered.[10]

Barriers Encountered

Finding a standing time for meetings was difficult. Residents noted the lack of standing meeting times as a

potential barrier to productivity. This meant residents met when feasible: approximately 1 to 1.5 months apart during the study period. In terms of best practices, we suggest that programs initiating a resident council build in a standing meeting time when implementing this model.

Subgroup Results

The TABLE includes examples of CCORE subgroup projects, including stakeholders involved and outcomes, for the time period 2009–2010.

Discussion

Our resident-driven quality council was effective in promoting the development of systems thinking in residents, increasing their ownership of continuity clinic, and empowering them to implement system changes, and may be worthy of replication by other residency programs. Skills in practice management and systems thinking may be enhanced by CCORE participation, and focus group responses suggest that resident satisfaction appeared to increase.

Residents have not always understood roles or perspectives of other stakeholders, such as nurses and administrative assistants. CCORE membership appeared to enhance residents' ability to understand microsystem functions and roles, a signature of systems thinking.[17] While CCORE projects did not focus solely on quality improvement, the experience offered residents opportunities to design and implement targeted changes within a clinical microsystem. With their own experiences and feedback from other residents or patients, residents targeted aspects of clinic inefficiency within the PB subgroup.

Limitations

This was a single-site intervention, which limits generalizability. We also did not measure changes in systems thinking directly; rather, we relied instead on focus-group responses and QI project outcomes as a surrogate. It also is possible that residents' responses may have differed if one-on-one interviews had been used, as focus group interactions can affect participants.[18] Last, those residents with an interest in QI may be more inclined to participate in resident councils such as the CCORE.

Conclusions

Participation in the resident-led CCORE council allowed residents to initiate SBP and PBLI activities and actively participate in real-world microsystem changes. This ambulatory resident council was highly acceptable to residents, feasible for replication in other settings, and considered sustainable after 2 years of operation. Future areas for research include the effect of CCORE participation on measures of residents' systems-thinking skills, practice management skills, and systems improvement skills, as well as the effect of participation on resident satisfaction.

References

1. Bernabeo EC, Conforti LN, Holmboe ES. The impact of a preventive cardiology quality improvement intervention on residents and clinics: a qualitative exploration. *Am J Med Qual*. 2009;24(2):99–107.
2. Mohr JJ, Randolph GD, Laughon MM, Schaff E. Integrating improvement competencies into residency education: a pilot project from a pediatric continuity clinic. *Ambul Pediatr*. 2003;3(3):131–136.
3. Morrison LJ, Headrick LA. Teaching residents about practice-based learning and improvement. *Jt Comm J Qual Patient Saf*. 2008;34:453–459.
4. Voss JD, May NB, Schorling JB, Lyman JA, Schectman JM, Wolf A, et al. Changing conversations: teaching safety and quality in residency training. *Acad Med*. 2008;83(11):1080–1087.
5. Asao K, Mansi IA, Banks D. Improving quality in an internal medicine residency program through a peer medical record audit. *Acad Med*. 2009;84(12):1796–1802.
6. Leshan LA, Fitzsimmons M, Marbella A, Gottlieb M. Increasing clinical prevention efforts in a family practice residency program through CQI methods. *Jt Comm J Qual Improv*. 1997;23(7):391–400.
7. Schneider GW, DeHaven M, Snell LM. Fostering a culture of prevention in a residency program through a continuous quality improvement project. *Am J Med Qual*. 2003;18(2):82–89.
8. Wise GR, Charles-Marcel Z, Pettis JL. QA in the resident clinic. *QA Rev*. 1990;2(10):2–3.
9. Bessmer J, Vokoun C. Putting continuity back into resident clinics. *Acad Intern Med Insight*. 2008;6:13–16.
10. Fleischut PM, Evans AS, Nugent WC, Faggiani SL, Lazar EJ, Liebowitz RS, et al. Ten years after the IOM report: engaging residents in quality and patient safety by creating a house staff quality council. *Am J Med Qual*. 2011;26(2):89–94.
11. Strauss A, Corbin J. *Basics of Qualitative Research: Grounded Theory Procedures and Techniques*. Thousand Oaks, CA: Sage Publications; 1990.
12. Miles MB, Huberman AM. *An Expanded Sourcebook: Qualitative Data Analysis*. 2nd ed. Thousand Oaks, CA: Sage Publications; 1994.
13. Hoepfl M. Choosing qualitative research: a primer for technology education researchers. *JTE*. 1997;9(1). http://scholar.lib.vt.edu/ejournals/JTE/v9n1/hoepfl.html. Accessed May 17, 2011.
14. Soderquist KE. PhD seminar series, qualitative research methodology—defining and conducting case-based research: analyzing case study data. http://www.dmst.aueb.gr/gr2/diafora2/YPD2/PhD%20Sem%20March%2004.ppt#2. Accessed December 14, 2010.
15. Patton MQ. *Qualitative Research and Evaluation Methods*. Thousand Oaks, CA: Sage Publications; 1980.
16. Myers JD, Skeen S, Mirkes C, Cable C, Colbert C. A resident-led community clinic cabinet for quality improvement at Scott & White/Texas A&M HSC COM. Poster presented at: Academic Internal Medicine Week 2009; Philadelphia, PA.
17. Colbert CY, Ogden PE, Ownby AR, Bowe C. Systems-based practice in graduate medical education: systems thinking as the missing foundational construct. *Teach Learn Med*. 2011;23(2):179–185.
18. Makeham M, Dovey S, Runcinan W, Larizgoitia I; Methods & Measures Working Group of the WHO World Alliance for Patient Safety. Methods and measures used in primary care patient safety research: results of a literature review. http://www.who.int/patientsafety/research/methods_measures/makeham_dovey_full.pdf. Published 2008. Accessed September 18, 2011.