UCSF Department of Family & Community Medicine
Center for Excellence in Primary Care

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Profiles of Three High-Performing Primary Care Residency Clinics

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This report was prepared by the Center for Excellence in Primary Care (CEPC) at the University of California, San Francisco.

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Introduction

For most Americans, primary care is the portal to health care. It encompasses a broad range of services and coordinates care with specialists, hospitals, and the entire panoply of health care providers. Because primary care medical residents need to learn their skills at many different sites—inpatient, emergency department, intensive care unit, and ambulatory specialty practices—their time in primary care clinics is limited, sometimes to only one or two half-day sessions per week. A big challenge for medical residency programs is how to offer excellent training for tomorrow's physicians while providing the best care for today's patients.

This report describes three primary care residency clinics that are meeting that challenge by harmonizing the education and patient care missions of primary care teaching practices. These residency programs are rethinking resident schedules, improving continuity of care and access, and building teams that give both patients and residents comfortable places to receive and provide care. At the same time, residents are learning how it feels to work in a well-organized primary care practice, which can inspire them to enter a lifelong career as a primary care physician leader.

In 2013, the Center for Excellence in Primary Care (CEPC) at the University of California, San Francisco created a project team to observe primary care residency teaching clinics associated with internal medicine, family medicine, and pediatric residency programs and to find clinics with high-quality care and resident experiences. The methods and results of that research are described in a 2016 AAMC-UCSF report, *High-Functioning Primary Care Residency Clinics: Building Blocks for Providing Excellent Care and Training*.[1] The team's observations were organized according to the primary care improvement model—the Building Blocks of High-Performing Primary Care—which includes 10 features of good primary care and 3 of good resident training (Figure 1).

Team members visited 45 clinics, and during many of those visits, residency directors and clinic medical directors asked for detailed descriptions of how high-performing teaching clinics function. This report, *Profiles of Three High-Performing Primary Care Residency Clinics*, is a response to that request.

The three site visits were performed in different years and were updated with follow-up communications between the project team and site leadership. It was decided not to provide detailed performance data because those data are always changing. All three sites have reported excellent clinical, operational, and patient experience performance. All three sites have physician champions who led a years-long journey from an average clinic to an excellent clinic.

The profiles, coauthored by CEPC researchers and leaders of the programs, follow the Building Blocks of High-Performing Primary Care model adapted to teaching clinics. Each profile focuses on the building blocks that have been particularly well implemented by that teaching clinic.

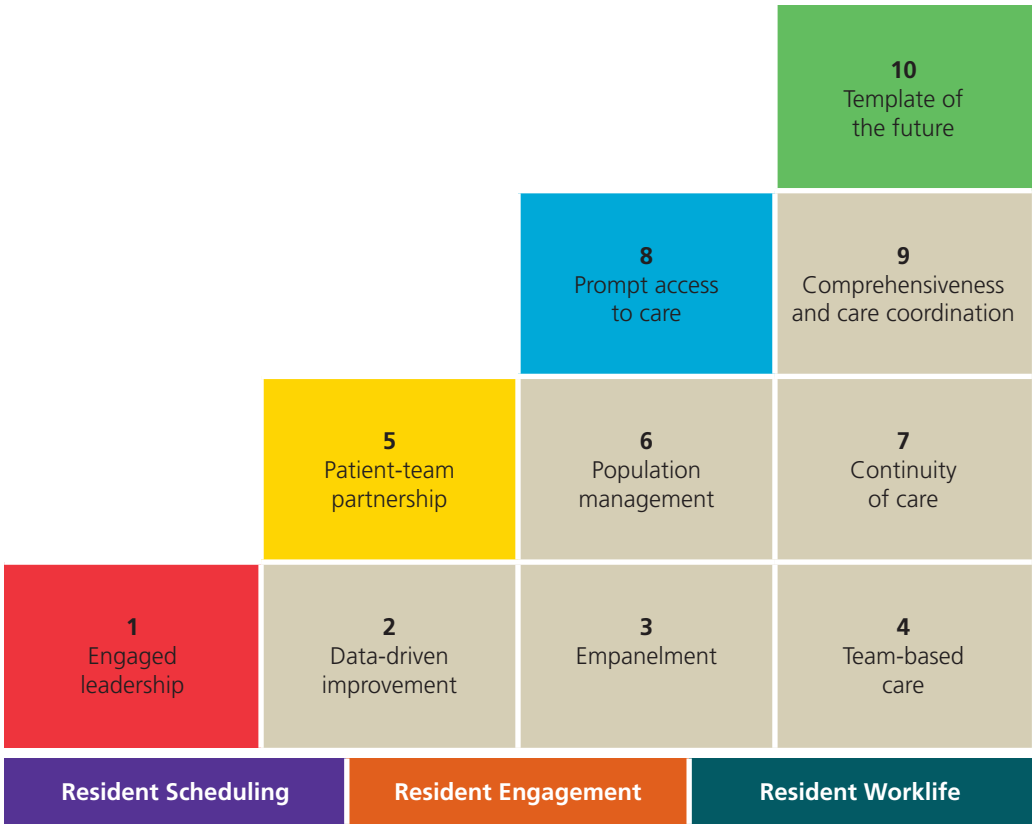

Figure 1. Building Blocks of High-Performing Primary Care model for residency teaching clinics.

All three clinics have figured out ways to schedule residents so that continuity of care, access to care, and team-based care are optimized. These clinics teach residents population-based care by organizing robust panel-management processes. The clinics track and report on clinical and operational data to assess performance and teach residents how to use data to improve patient care. Finally, the clinics engage residents in their improvement journey, teaching them to be both excellent clinicians and medical leaders.

Many leaders of teaching clinics across the country ask, Has anyone solved the challenge we face of providing both excellent care by residents and excellent training? These profiles should be helpful to the hundreds of primary care residency programs whose leaders are determined to improve their teaching clinics and to residencies in a variety of specialties that share many of the same challenges as primary care teaching programs.

If you are a leader, faculty member, or resident at a teaching clinic, looking through the three profiles will answer questions you have about resident scheduling, continuity of care, team-based care, and other issues. If you would like to learn more, the AAMC-UCSF report *High-Functioning Primary Care Residency Clinics: Building Blocks for Providing Excellent Care and Training* may be of interest. There,

you can find other residency programs at various stages of transformation and perhaps identify peers faced with challenges similar to yours. Additionally, academic primary care organizations have special interest groups that may be helpful in identifying communities committed to high-functioning primary care in residency training.

In the end, initiating the process of transformation takes clearly defined goals, along with a healthy dose of commitment, perseverance, and tireless communication with a range of stakeholders. As demonstrated in the following profiles, graduate medical education training programs can successfully incorporate the elements of high-functioning primary care into their ambulatory experiences. Showcasing high-quality care alongside high-quality training may now be the best marketing tool for the future primary care workforce.

NOTE

1. Association of American Medical Colleges, University of California, San Francisco. *High-Functioning Primary Care Residency Clinics: Building Blocks for Providing Excellent Care and Training*. Washington, DC: AAMC; 2016. aamc.org/buildingblocksreport.

Crozer-Keystone Family Medicine Residency, Center for Family Health

MARIANNA KONG AND WILLIAM WARNING

The Center for Family Health (CFH) is part of southeastern Pennsylvania's Crozer-Keystone Health System. The 30 residents in the Crozer-Keystone Family Medicine Residency program attend two clinic sites for their primary care ambulatory rotation, with most of their time spent at the CFH in Springfield, Pennsylvania, a suburb of Philadelphia.

CFH serves roughly 7,000 active patients with about 20,000 visits per year. The patient population is approximately 85% Caucasian and 15% African American and Hispanic. About one-third of patients are Medicare patients, one-third Medicaid or uninsured, and one-third privately insured. CFH has been certified as a Level 3 patient-centered medical home (PCMH) since 2009.

The clinic has a small, predominantly clinically focused faculty, with 12 attendings comprising about 10 clinical FTEs. There are no physician assistants or nurse practitioners. The clinic hosts up to six medical students at a time from Temple University Lewis Katz School of Medicine, Drexel University College of Medicine, and Philadelphia College of Osteopathic Medicine.

ENGAGED LEADERSHIP

Primary care transformation has been led by William Warning, MD, CFH's residency director. The first phase of clinic redesign began in 2008. With support from the Chronic Care Initiative, a Pennsylvania multipayer initiative for practice improvement, CFH created a diabetes dashboard for population management that enabled the clinic to report chronic disease measures and to collect clinic-specific and provider-specific data. An on-site care manager position was created for intensive diabetes care management.

In 2013, the second improvement phase began, with a focus on management and leadership; faculty, staff, and residents were engaged in the process. Working groups had representation from each category of staff. During the redesign rollout, CFH held weekly faculty meetings and plan-do-study-

act (PDSA) redesign elements with single physician and medical assistant (MA) pairs. Three areas were addressed during the redesign: establishing the requisite infrastructure, patient-centered medical teams, and change management.

Establishing the requisite infrastructure. To establish the infrastructure of staffing and culture necessary to enable effective redesign, leaders focused on the following:

- Creating a business plan and obtaining adequate support staff so that teams could truly function.
- Changing the residency model from traditional residency rotations to an office-based model of resident education. The motto "Clinic is the curriculum" was created and the clinic was prioritized when restructuring resident schedules and curriculum.
- Building the clinic's capacity for education—requiring two preceptors per session (for a ratio of one preceptor to three residents) to create a better teaching environment.

Creating patient-centered medical teams. CFH redesigned care teams in a "physician led, MA run" team model. The goals were to promote and expand the role of the MA to the forefront of the team to enhance clinical care, consistently meet preventive care needs, and improve efficiency. The motto for this strategy was "tasks for staff, decisions for physicians." The idea was to educate and empower, not delegate—meaning, not to offload work onto MAs but rather empower them to work in expanded roles and free up physicians to focus on clinical decision making.

Promoting a culture of change. CFH held presentations on change management, analyzed sources of change resistance, and conducted one-on-one meetings with individuals as needed. One guiding principle was to hold providers and staff accountable for measures they directly control. Ongoing practice improvement is also fostered in an annual SWOT (strengths, weaknesses, opportunities, threats) analysis, with all MAs, residents, faculty, and staff completing anonymous surveys from which ideas are brought to a leadership team.

DATA-DRIVEN IMPROVEMENT

CFH has used Centricity as the electronic medical record (EMR) since 2003, with modifications to optimize population health, visit management, and visit templates. The proactive care form, a flowsheet in each patient's chart, populates with information on the patient's health care maintenance and disease management tasks. Sections on the flowsheet include preventive care, diabetes/hypertension/lipids, heart failure, osteoporosis, chronic obstructive pulmonary disease, and depression screening, with fields for current value, goal value, due date, and exclusions. The EMR user is also able to click on links to view corresponding guideline recommendations for individual items.

Data from the proactive care flowsheet automatically populate a homegrown dashboard, providing practice- and provider-specific panel data across the Crozer-Keystone health network. The dashboard includes sections on preventive care, cancer screenings, diabetes care, lipids, and emergency department/hospitalization utilization.

Providers, including residents, log on to the dashboard to view population metrics for their individual panels. For each measure, the display includes the number of applicable patients, percentage not up-to-date, and number of patients due for each item. Users can chart these over time, as well as pull up lists of patients overdue for the measure and sort them by physician, last visit in clinic, and communication with the patient to address the overdue service.

A network-wide quality and population management director sets the annual focus and outcome targets for the health network. Each clinic has a quality champion to review dashboard parameters not met and make a plan to address them. At CFH, dashboard data are reviewed at monthly practice-wide meetings on Wednesday mornings when the clinic is closed to patients. At a separate monthly operations meeting, residents, faculty, and the CFH practice manager brainstorm issues around flow, teams, huddles, and PDSA cycles. Residents attend clinic meetings unless they are on away electives or inpatient rotations. In addition to clinical measures, CFH collects data on patient satisfaction, patient flow, and wait times. Challenges are organized around metrics needing improvement, such as the colonoscopy challenge that promotes a healthy competition among teams to incentivize patient outreach.

TEAM-BASED CARE

Team structure. Each of the three CFH primary care teams—blue, green, and red—cares for about 2,000 patients. Teams have three to four faculty attending physicians, two MAs, and 9–10 residents. The registered nurse (RN) care manager, pharmacist, social worker, and psychology students work across all three teams.

Teams are divided into "teamlets"; six teamlets run each clinic session. Each teamlet consists of one provider, one MA, and perhaps one medical student. About three medical students are in clinic at a time and work with teamlets of residents (second years [R2s] or third years [R3s]). Faculty members usually work with the same MA on their color team. Residents work with any of the six MAs, preferably with the two MAs from their color team. CFH is working on scheduling individual residents on certain days of the week to improve consistency of resident-MA pairings.

Co-location. Providers, MAs, behavioral health, clinical pharmacy, and social work are co-located in the main workroom. The workroom has six work stations, one for each teamlet, with room for three seats and three laptops each; each teamlet will be at one station for the day, with the provider and MA sitting next to each other. A separate precepting area is connected to the main workroom. In the past, MAs worked in pods down the hall from the provider workroom. Co-location has enabled constant communication between providers, MAs, social workers, and the behaviorist team.

Medical assistants. MAs who were involved in the redesign of their roles are trained in a standardized manner to work with different providers. MAs review patient charts and do previsit planning, including preparing a routing slip on each patient by filling in the status (due or up-to-date) for each relevant item and the dates that the patient will need appointments for a colonoscopy, mammogram, and Pap smear. Upon patient checkout, the front desk uses the routing slip to make future appointments for the patient.

During intake, MAs take a brief history, review medications and ask whether refills are needed, and screen for depression. They also ask a series of questions about whether the patient has a durable power of attorney, smokes and is open to quitting, has religious beliefs that may affect health care choices, and has been to any other health care facilities since the last visit to this facility. MAs can order labs, referrals, mammograms, and colonoscopies for providers to review and sign. For patients with blurry vision, MAs check visual acuity; if patients are dizzy, they do orthostatics; if there is a respiratory issue, they do pulse ox; if there are urinary complaints, they do a urinalysis. For patients with diabetes, they make sure A1c, microalbumin, lipids, eye exams, and foot exams are completed in a timely manner.

Checklists and other relevant clinic workflow documents are kept in binders at every teamlet station. Between patients, MAs check their EMR inboxes, help providers with forms, and update the patients' proactive care flowsheets. MAs attend "lunch and learn" sessions to deepen their knowledge base. The clinic continues to work on promoting MAs as the team member who runs the teamlet and teaching residents to work with MAs in their expanded roles.

Interdisciplinary roles. The social worker and social work students are co-located in the workroom with the teamlets and are in clinic four days a week. The pharmacist and pharmacy students do medication reconciliation and see patients for warfarin management. The director of behavioral sciences reviews the daily clinic schedule to screen for patients with behavioral health needs and meets with teamlets to coordinate care and do brief case-based teaching.

The RN care manager, who supports all teams, is responsible for hospital discharge appointments, diabetes education, and care coordination for patients with complex health care needs and high emergency department/hospital utilization. The RN contacts discharged patients within 48 hours and schedules them for double-slot visits. She reviews hospital charts, prepares medication reconciliation, and huddles with the teamlet seeing the patient. She provides intensive counseling and self-management support for complex patients.

Huddles. Before each clinic session, the physician and MA huddle to discuss their patient list for the session, with a checklist as a guide. Using the prepared routing slips, teamlets review each patient on the schedule and discuss what issues to address in the visit and what preventive health tasks are due. The behavioral health director and RN care manager may approach teamlets about relevant patients on the schedule during the huddle. The huddle is also a time for discussing clinic flow and what the medical student role will be for the session.

RESIDENT SCHEDULING

R1 residents have one to two primary care clinic sessions per week (two to three per week on certain rotations), which averages about 15% of their time over the year. R2s are in clinic three to four times per week, and R3s are there four to five times per week, averaging 40–50% of their time over the year. During CFH's transformation process, the residency leadership made a decision to prioritize the

clinic as the home for the residents' education. The motto "Clinic is the curriculum" was created to represent the shift to a PCMH-based model of resident education, and resident clinic scheduling was changed accordingly. Some rotations were inflexible, but for other rotations the clinic was given priority in resident schedules. The program is also trying a system of scheduling individual residents in clinic on the same days each week to optimize continuity of care and team consistency.

RESIDENT ENGAGEMENT AND WORKLIFE

Residents have been heavily involved in the PCMH redesign planning and implementation, working on processes such as work station design, office flow, and team role revision. During clinic months, residents have scheduled time to work with the CFH practice manager and medical director on longitudinal quality-improvement (QI) projects lasting one to two years, with an emphasis on using root cause analysis. Each year a few R2s and R3s with special interest in PCMH transformation are fully involved in transformation meetings and the statewide improvement collaborative.

R2s have a six-week clinic foundation course, as well as a CFH classroom month, during which residents have sessions on practice management (legal, billing/coding, leadership), QI, PCMH, and dashboard management, in addition to shadowing front desk staff. R3s spend a four-week block in a clinic mastery curriculum that focuses on leadership development and offers time to work with the practice manager.

Residents gain leadership experience through the position of the "teaching star" (T*) resident. The T* has no patients scheduled and responsibilities include precepting interns' clinical teaching. The T* covers the acute care in-box, triage, and acute phone calls; helps screen and address abnormal lab results; and works on resident clinic flow and the juggling of patient schedules. This role gives residents experience in a clinic attending role while teaching and supporting other residents. In addition, as a T*, R2s and R3s teach the medical students on their teamlets.

Residents appreciate the experience of helping to improve the clinic and feel that they are graduating from a true medical home. The strength of the teams is cited as a major contributor to resident satisfaction and draws some residents to stay with CFH after graduation. Residents like working closely with MAs in their teamlets. One R3 looking for a job after residency stated, "It's hard to find a place to work like this [clinic] ... I feel like I've kind of been spoiled." Hopefully the discrepancy between the graduates' expectations and the reality of practice will create tension to drive further innovation in primary care.

SUMMARY

The Center for Family Health provides a notable example of deliberate practice transformation, with conscientious involvement of all staff and residents. Implementing the redesign was a stressful, challenging process, requiring investment of "front-end pain for back-end gain." The back-end gain is demonstrated in the high level of team-based care, with empowered and educated MAs as the core of

the teamlet model. Co-location contributes to seamless communication among team members. Yet despite the clinic's progress, CFH leadership feels that the work is not complete and continues to strive for improvement. By embracing the concept of "Clinic is the curriculum," CFH trains residents with excitement for high-functioning primary care.

University of Massachusetts Medical School–Baystate Internal Medicine Residency, High Street Health Center–Adult Medicine

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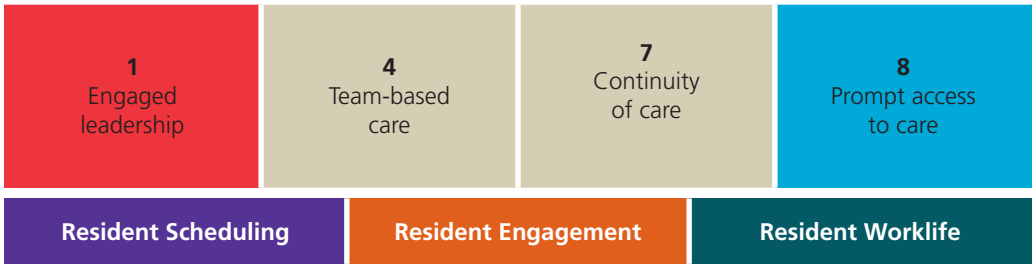

Baystate Health is a nonprofit health system centered in Springfield, Massachusetts, a working class city of 150,000. Baystate owns five hospitals and 60 medical practices, and its providers deliver 1.4 million outpatient visits annually. About 29% of Springfield's population lives below the poverty line; median household income is $34,000 ($52,000 for the United States).

The primary teaching site of the University of Massachusetts Medical School–Baystate (formerly Baystate-Tufts) Internal Medicine Residency is at the Baystate High Street Health Center–Adult Medicine (BHSHC-AM) in Springfield. Of about 10,000 BHSHC-AM patients, 48% are Spanish speaking, 23% have diabetes, 30% have Medicare, 23% have fee-for-service Medicaid, and 30% have managed Medicaid. BHSHC-AM is located in one of the state's poorest census tracts. The health center achieved Level 3 NCQA patient-centered medical home (PCMH) recognition in 2012 and 2015.

The residency has 18 residents per class, and about a quarter are in the primary care track. Residents have three clinic sessions per week on ambulatory blocks. Over 50% of primary care residents' training is in the ambulatory setting compared with about 40% for categorical residents (i.e., residents likely to pursue medical subspecialty careers).

ENGAGED LEADERSHIP

BHSHC-AM has not always been high performing. In 2006, the health center did not have a team model, faculty did not have a strong presence, and providers worked with multiple staff members. During our site visit, staff reported that 10 years ago, BHSHC-AM was "a work in progress with plenty of opportunities." Residents often saw other doctors' patients, did not know their patients, and seldom followed up with the same patient. Follow-up appointments were booked after the patients left, and sometimes patients never found out about them. Waits for appointments could approach six months.

Since 2006, BHSHC-AM has been engaged in a redesign journey, starting with participating in the Institute for HealthCare Improvement's (IHI) Collaborative—Redesigning the Clinical Office Practice Community and, more recently, in the NCQA and Massachusetts' Patient Centered Medical Home Initiatives. The improvement was led by Michael Rosenblum, MD, who was the health center's medical director and then the residency director.

A defining feature of BHSHC-AM is the small, focused faculty, whose members lead their care teams. Eight years ago, many attendings had one patient care session and two precepting sessions per week, with inpatient responsibilities competing with ambulatory duties. The residency program invited faculty to commit to the clinic, with no further inpatient responsibilities; some faculty accepted this new role. New faculty were recruited to focus on outpatient care and teaching. Right now, 11 faculty physicians make up 8.5 FTEs, and 7 advanced-practice clinicians—nurse practitioners (NPs) and physician assistants (PAs)—are nearly full-time. Some faculty have six patient care, two precepting, and two administrative sessions per week, meaning that the faculty's professional life is spent at the health center.

TEAM-BASED CARE

Team structure. BHSHC-AM has 10 stable teams, named for different colors. A team is stable when the same people consistently work together and patients are always cared for by their team. The 10 teams are paired into 5 sister teams. The typical team has one attending and five to six residents. An advanced-practice clinician supports two sister teams seeing patients in eight sessions per week. Each team has a registered nurse (RN), a medical assistant (MA), and one front desk staff (patient service representative, or PSR). Panel size per team is more than 1,000. Most patients know their team and their team's members.

Key to team stability are faculty who are present in the clinic 50% of the time or more. It is rare for providers or staff to work on a team or in a space that is not their own. Providers work with the same MA about 85% of the time.

Team culture. To construct a cohesive team identity and culture, BHSHC-AM has each team working together in the same small, intimate, and well-organized space, or pod. Co-location—allowing team members to work closely together and providing every team (together with the sister team) a "home" space—is key to the positive team culture at High Street. The five co-located pods, one for each sister team pair, are decorated with team colors and art work.

The health center has pioneered "team day," one day each week for each team when the entire team is present. Sister teams inhabit the same eight-person co-located pod, so sister teams have separate team days. On team day, the attending is precepting residents, not seeing patients. Team day is a bonding time, with the pod full and crowded with a calm, friendly, and cooperative atmosphere and team members who are constantly conferring about the patients they are seeing. As one RN put it, "Team day is hectic, but I love it."

Residents remain on their team for three years, forging close relationships. The team RN, who knows many of the team's patients, acts as the linchpin that holds the team together. The advanced-practice clinician (an NP or a PA) covering two sister teams often provides the continuity, seeing patients whose primary care provider (PCP) is not present. Front desk staff know which team the patients are on and use a booking algorithm to support continuity.

Residents feel pride in their team. They look out for each other, jumping in to support a teammate who may be behind. Each team thinks it is the best.

TEAM ROLES

Medical assistant. In addition to rooming patients, MAs alert RNs to vaccinations due, verify smoking status, and complete PHQ-2s (patient health questionnaires for depression screening) and fall-risk assessments. During nonteam days, they manage chronic disease registries, contact diabetic patients who are overdue for services, and track consultations and diagnostic-test results. MAs helped improve pneumovax and colorectal screening performance to above the national 90th percentile. All MAs room patients during the first hour of every session to get the clinic started promptly on time and reduce cycle time.

Registered nurse. RNs are the "glue" of the team and establish therapeutic relationships with many of the team's patients. RNs provide nurse visits with diabetic, asthmatic, and hypertensive patients and with those regularly taking Coumadin and controlled substances. RNs made a major contribution to the decrease in the average HbA1c in the past few years. They give all injections through standing-order protocols. The RN goal is 40 nurse visits with patients per month.

RNs spend considerable time handling messages coming from the call center, PSRs, MAs, or providers. Because the RNs know their teams' patients, they can address many issues without provider input. Many refills are performed by the team RN via protocol. On team days, RNs are available for everything that comes up—vaccines, forms, calls, lab results, refills, answering resident questions. On nonteam days, RNs have more time for RN visits and patient follow-up.

Each day, 2 RNs perform phone triage. During triage sessions, RNs often refer patients to the team RN who knows them best. Having phone calls routed quickly to the team RN increased the rate of first call resolution, reducing delays and backlog.

Patient service representative. PSRs check patients in and out, make appointments, manage incoming phone calls, and fill no-show or cancellation slots with patients wanting appointments. They also arrange lab and diagnostic study appointments and make sure that patients leave the health center with educational materials and follow-up appointments.

Pharmacist. BHSHC-AM has a weekly clinic focused on polypharmacy, complex medication reconciliation, and medication adherence and education led by a pharmacy faculty member who is a preceptor of pharmacy students.

Behavioral health clinicians. BHSHC-AM has an on-site behavioral health clinic that is open every day and staffed by a clinical psychologist and a licensed certified social worker (LCSW). Both are available for warm handoffs and assistance with housing, food, fuel, income, transportation, and geriatric issues.

Interpreter. BHSHC-AM's five in-clinic, full-time Spanish interpreters are available for the many patients whose primary language is Spanish. Baystate also has interpreters available for more than 20 other languages.

Staffing ratios. It is difficult to calculate staffing ratios because each team is designed to expand or contract according to the number of providers and learners present. The crucial staffing improvement was having one full-time RN and one half-time advanced-practice clinician per team, which allows teams to have a full-time, stable person whom the patients know and who knows the patients. Revenue streams such as pay-for-performance and NCQA Level 3 recognition incentives, cost control, and smart scheduling have allowed BHSHC-AM to increase staffing ratios.

Workflows. BHSHC-AM has created detailed workflow maps for electronic in-box messaging, patient calls, the rooming process, prescription refills, and more. Team members follow the workflows, which have been successful in improving efficiencies—for example, enhancing patient access, reducing cycle time and call turn-around time and raising scores for some quality metrics to the top values specified in national standards.

Defined roles with training. Seasoned team members train RNs and MAs for four to six weeks using a detailed orientation package. Some staff, identified as champions, are available as resource experts.

Communication. Staff meetings occur monthly, and providers meet every two weeks. Team communication and huddling is constant throughout the day in the co-located pods. Because of the ease of team communication, structured huddles were not adding value, so they are no longer used regularly.

CONTINUITY OF CARE

BHSHC-AM measures continuity of care by team. Team continuity means continuity with two people: the team PCP and the team advanced-practice clinician, who serves as the team continuity anchor. Team continuity has hovered between 70% and 80%.

The PSRs' booking algorithm is this: 1) Offer patients appointments with their PCP; 2) If the PCP is unavailable and the patient wants an appointment sooner, the PSR offers to make an appointment with the team advanced-practice clinician; 3) On the rare occasions when this is not possible, patients

are offered another provider on their team or (last resort) the sister team. PSRs are intensively trained to "book to the team." Advanced-practice clinicians view themselves as the first line of defense for residents' patients, co-managing patients with residents. When third-year residents (R3s) graduate, their patients remain on the same team.

PROMPT ACCESS TO CARE

The BHSHC-AM access aims include making all appointments within two weeks of the patient's request, making urgent appointments with the patient's team within 24 hours, responding to patient calls within 24 hours, having team continuity of care 80% of the time, and reducing no-shows by 50%. Efficiency aims are having the patient roomed by the appointment time, the provider ready for the patient within 15 minutes of the appointment time, and a total cycle time less than 2.5 times the appointment duration (for example, 50 minutes for a 20-minute visit). Before 2008, cycle time was two hours; in 2016, it was 63 minutes for all providers and 43 minutes for attendings.

In 2008, schedules began to be opened for patients' appointments only two weeks in advance. The no-show rate dropped from around 40% before 2008 to about 25%. The third next available return appointment (TNAA) also dropped from more than 60 days for appointments with residents and faculty before 2008 to less than one day with the team. Recently, the schedule has been opened up to four to six weeks in advance. Having advanced-practice clinicians not only provides continuity for the team, it also allows most patients to be seen promptly.

Previously, triage nurses handled calls from patients they often did not know. Currently, calls are often routed to the team RN who knows the patient, which helps minimize the number of messages about those calls and provide faster call resolution. As a result, calls per day decreased 31%, abandoned calls decreased 75%, electronic messages decreased by almost 50%, and calls answered within 30 seconds improved by 122%.

RESIDENT SCHEDULING

To allow residents to be in clinic more consistently, thereby improving continuity of care, and to eliminate the tension created by having to go from the hospital in the morning to the clinic in the afternoon, the Baystate residency pioneered a scheduling model called the two-week miniblock in 2008. Initially designed for second-year residents (R2s), it was expanded to all residents in 2015. Most blocks are divided into alternating two-week inpatient and two-week ambulatory experiences.

First-year primary care residents have about five months of ambulatory and elective rotations and about seven months of inpatient rotations, organized in two-week miniblocks. In the second and third years, the ambulatory and elective time increases to about seven months. During ambulatory and elective time, primary care residents see their BHSHC-AM patients for three sessions per week. The remaining seven sessions are specialty rotations, didactics, and a community project.

For most of their residency, primary care residents are never away from clinic for more than two weeks except for vacation. In this way, Baystate has confronted the tension between education and continuity, achieving both to a great degree. Administrators and participants in the residency program strongly believe that to be a great primary care physician, one needs to see one's own patients over time to develop a continuous healing relationship.

In comparison, categorical residents have only two months of ambulatory rotations in the first year, three in the second year, and two in the third year, and they also follow a miniblock schedule. Like their primary care counterparts, they also have three sessions with BHSHC-AM patients per week during their ambulatory time.

Each year, the residency leadership gives the clinic manager responsible for scheduling patients a block schedule for each resident's rotations and vacation time. The clinic manager knows the residents' team assignments and team days and follows predetermined rules that establish how many clinic sessions there should be for a given rotation. One BHSHC-AM goal is to have at least three residents present for each preceptor and never more than four. The clinic rarely cancels patients' appointments. Because the pods are small, space issues figure significantly into scheduling. It takes somewhat of a genius to create schedules that work.

RESIDENT ENGAGEMENT AND WORKLIFE

New residents participate in a carefully scripted, week-long introduction to BHSHC-AM and their teams during their intern orientation. R1s are called learners, R2s are managers, and R3s are teachers. R2s learn to manage their patients with excellence; R3s teach R1s, facilitate conferences, and run the ambulatory morning report.

Clinic and residency leadership embrace the vision that "great education comes only from exemplary patient care." R3s, as teacher residents, assume the role of medical director as they oversee walk-in patients, "co-precept," and monitor provider flow. The ambulatory chief resident is a key mentor for the teacher residents' growth as educators and leaders. Rather than listen to formal education about the patient-centered medical home, residents experience the medical home at BHSHC-AM.

During our site visit, many residents, faculty, and staff attested to their positive feelings for BHSHC-AM. The retention rate for physicians is high, with some residents wanting to stay as attendings. The residency leadership has surveyed residents about the miniblock schedule, and 90% of them support it. Survey comments have included, "It has increased the ability to focus on care, and not get exhausted," and "I can see my patient in the clinic, give a three-week appointment, have two weeks inpatient and then see the patient again in the clinic. I like that."

SUMMARY

Outstanding features of the Baystate residency program are 1) the two-week miniblock model; 2) a small, dedicated faculty; 3) the structure, culture, and co-location of the teams; 4) the high continuity of care with either the team PCP or the team advanced-practice clinician; and 5) the central role of the team RN and support staff. These features are interdependent.

The two-week miniblocks maximize resident clinic time, which facilitates team stability and collaboration. This scheduling strategy allows residents to focus on either hospital or clinic tasks, thus minimizing inpatient distractions while at clinic. By committing full-time to the clinic, the faculty serve as clinical leaders and continuity anchors for their teams.

Residents report *feeling at home* while in the clinic, in part because they spend three years on the same team. They have a regular home workspace, which confers a sense of identity, belonging, and pride. The team structure converts a relatively large health center into 10 small subunits. Each team space becomes the ambulatory home for its residents and a familiar site for its patients.

University of North Carolina Family Medicine Residency, UNC Family Medicine Center

THOMAS BODENHEIMER, SAMUEL WEIR, THOMAS KOONCE, AND CRISTEN PAGE

The University of North Carolina (UNC) Family Medicine Residency is expanding to an 11-11-11 program (11 residents in each of the three years) in which most residents have their primary care clinic at the Family Medicine Center (FMC), on the UNC campus but separate from UNC Hospitals. The UNC FMC handles more than 60,000 patient visits per year for 17,000 patients. The FMC is certified as a Level 3 patient-centered medical home (PCMH). Almost 60 clinicians, including 24 residents, care for patients at the FMC.

ENGAGED LEADERSHIP

The excellence of UNC Family Medicine is in no small part due to two outstanding leaders: Warren Newton, MD, former residency director and former chair of family medicine, and Sam Weir, MD, who was FMC's medical director from 2005 to 2013. The FMC has a large faculty at the clinic, most of whom come to the clinic on a very part-time basis. The leadership allows the faculty a certain amount of autonomy while ensuring that faculty members take their ambulatory responsibilities seriously.

For most faculty, clinic is a minor part of their departmental responsibilities. However, faculty physicians are now required to see their own FMC patients in at least two half-day sessions per week in addition to precepting sessions, and they are tasked with responding to electronic messages every day. Some junior faculty are doing more clinic sessions, and leadership has created incentives to keep junior faculty committed to more clinic time. In the past, faculty could cancel their clinics without asking permission; currently, an access-centered rule determines whether faculty or residents are allowed to cancel an FMC session for a late-scheduled meeting, conference, or other event. If the FMC's capacity to see patients that day is 115% of expected patient demand, the request is approved. If capacity is below 115% of demand, the request will usually be denied unless a faculty replacement can be found to work that clinic session. The FMC tracks data on faculty and residents who cancel their patients and on how many patients' appointments are cancelled. Faculty must complete their contracted number of clinic sessions and hours during the course of the year.

The residency and FMC leadership have created a culture honoring data-driven improvement, prompt access to care for patients, and continuity of care.

DATA-DRIVEN IMPROVEMENT

The UNC Family Medicine Center is impressively data driven. Not only are data collected and tracked on a large variety of clinical and operational metrics, but these data are posted everywhere. Walking through the FMC one eyes data walls at every turn.

The data specialist who collects and reports the data is part of the clinic leadership team. Clinical metrics include the percentage of patients who needed screenings and were screened for cancer, depression, and/or fall risk; the percentage of patients who needed immunizations and got them; and diabetes process and outcome measures. Operational metrics include third next available appointment (TNAA), continuity of care, on-time-start rooming, on-time-start provider, calls answered within 30 seconds, and cycle time. Patient, provider, and staff satisfaction are tracked. The data include information at the team and provider level, including residents, and each provider's performance is transparent for all to see.

On a large white board at each team's work area are the team's clinical metrics for the previous month and operational metrics that are current FMC priorities—for example, on-time starts for staff and providers. For each metric, the target is listed and red or green dots indicate whether the target has been reached. Friendly competition among faculty, residents, and teams encourages turning red dots to green.

The FMC and each provider know how many individual patients have care gaps for each metric; for example, 300 more patients may be the number needed to reach the target for colon cancer screening. On the team white board, for each clinical metric, the number of each team's patients who had certain care gaps—such as overdue colorectal cancer screening—when they came to the clinic on each day of the current week is listed together with how many of those gaps were closed that day. For example, on Tuesday, seven patients on one team might have been overdue for a fecal immunochemical (FIT) test, and four of those gaps (the overdue FIT tests) were addressed by the end of that day. Each team's credentialed medical assistants (CMAs) huddle daily around their team white board to review opportunities to close care gaps. The entire clinical team meets monthly in front of their white board to discuss how they are doing and how to achieve not-yet-reached targets.

TEAM-BASED CARE

At the time of the site visit, the Family Medicine Center had four teams, named for regions of North Carolina. Pictures of the North Carolina countryside in each of these regions adorn the walls of the team spaces. Teams include about six faculty and six residents (two from each year), about six CMAs, and a team clerk. Each team is subdivided into provider-CMA teamlets, with each CMA linked with a mix of three or four faculty and resident providers. The teams are supported by other on-site services: behavioral health, financial counseling, nicotine-dependence counseling, nutrition counseling, social

services counseling, lab and X-ray services, clinical pharmacy, acupuncture, exercise training, and physical therapy.

Teams become chaotic if, for example, there are 20 physicians in clinic on a Tuesday afternoon and only 3 on a Thursday morning. To minimize providers or staff having to switch teams due to shifting numbers of providers on different days, the FMC has adopted a 16/16 goal: There should be 16 providers each morning and afternoon. Because resident schedules are not controlled by the FMC, achieving 16/16 requires that faculty fill in the gaps. For example, if there are only 6 residents in clinic on a particular morning, 10 faculty are needed. The 16/16 policy is implemented through a system of faculty preferences. Each year, faculty physicians list seven options when they are able to be in clinic. If a faculty member, for example, has contracted for four half-day clinics per week (seeing patients or precepting), the seven options state which half-days can be scheduled. After providing those options, faculty members keep those half-days protected. After the resident schedules are entered, faculty are scheduled—taking into consideration their preferences—so that the combined resident and faculty schedule achieves 16/16.

Exam rooms are standardized, and each one has a printer. Supply drawers are identical from room to room, and each drawer is labeled with its contents. The electronic medical record (EMR) is situated so that the provider and the patient can both see the screen. To reduce cycle time, providers are strongly encouraged not to leave the exam room during the visit. The cycle time target is 56 minutes, and the FMC has regularly been below 65 minutes.

Although the FMC has hallways rather than co-located pods, functional co-location has been achieved with stand-up work ("flow") stations, each used by a provider and the CMA working with that provider that day. Providers' exam rooms are contiguous with their work station. While the residents are based at a work station, an attending room supporting the four teams is available for precepting.

Each day, a "Where is my clinic today and who am I working with?" schedule is created. For each team, it lists the doctors working that session and which CMA they are paired with. The daily schedule also lists the physician for each team who is backup for in-basket messages. The majority of the time, CMAs work with one of the providers they are linked with.

One registered nurse (RN) and three licensed practical nurses (LPNs) function as communications (triage) nurses. Under standing orders, they refill many medications without consulting a physician. The communications team addresses almost all in-basket messages the same day. The FMC does not use a distant call center.

Well-trained CMAs follow the scripted standard work, including screening for tobacco, alcohol, drugs, depression, falls, and pain; medication reconciliation; and, if appropriate, rapid strep tests, EKGs, O_2 administration, orthostatic blood pressures, diabetic retinal photography, and diagnosis

and/or treatment of hypoglycemia—all under standing orders. CMAs have the major responsibility for panel management, identifying and addressing care gaps for cancer screenings, immunizations, and routine diabetes tasks.

One CMA on each team is the team lead and is responsible for the daily clinic flow and training of new hires. Training includes quizzes and check-off items on a competency list. To ensure quality, supervisors regularly audit staff using a checklist. Audits are a coaching opportunity and not punitive.

CONTINUITY OF CARE AND PROMPT ACCESS TO CARE

The Family Medicine Center tracks continuity of care from the patient perspective (percentage of patient visits that are visits with their empaneled provider). Each month, a bar chart shows continuity by provider; some providers were regularly achieving over 80%. Average FMC continuity is around 70% for both faculty and residents. How does the FMC achieve such good continuity performance even with 60 providers, most of whom see patients only two to three sessions per week?

Most important is the culture of valuing continuity of care and posting provider-level continuity metrics for all to see. The staff who answer phones and the CMAs and team clerks who make follow-up appointments after visits try hard to give patients appointments with their empaneled provider. While faculty and residents are not in clinic much of the time, they are in clinic almost every week.

The FMC has created a system to optimize both access and continuity. The TNAA is tracked weekly for the clinic as a whole, for each team, and for each provider. The goal is 10 days for return visits, and the goal is almost always achieved. With most providers having low TNAAs, continuity of care in addition to access is enhanced because patients offered an appointment with their empaneled provider are likely to accept that appointment since it is usually only a few days away.

With an adequate appointment supply to meet forecasted demand, continuity is further enhanced with a "continuity carve out" of about a quarter of each provider's appointment slots. Slots are frozen (locked) and programmed to thaw (open) based on the frequency of each provider's clinic sessions. When these slots thaw, they are reserved for each provider's patients, not another provider's patients. Only shortly before the visit can unused slots be opened to other providers on the same team. In this way, both continuity and access are maximized.

The FMC tries to control the panel size for each provider as another way to facilitate access and continuity. Ideal panel size is calculated using this formula: ideal panel size = the number of appointment slots the provider has in a year divided by the average number of visits per patient per year. For overpaneled providers (i.e., physicians with too many patients), demand will exceed capacity, and patients will not be able to gain prompt access. Panel size also affects continuity of care. Patients of overpaneled physicians often see other physicians because their primary care provider (PCP) has no available slots. Faculty panels are reviewed quarterly, and overpaneled physicians may have their panels closed.

RESIDENT SCHEDULING

An experienced manager is the scheduler for both the residency program and the Family Medical Center—for residents and faculty. She sees her job as a "giant jigsaw puzzle." The resident-scheduling model is 12 four-week blocks (two blocks are five weeks). On average, R1s are in clinic one half-day per week; R2s, two half-days; and R3s, three half-days. This varies with rotations. Except for vacations and up to one away-elective per learner, residents are always in clinic at least one half-day session per week.

In the spring of each year, an overall schedule is created for the entire academic year—which rotations each resident will have in which order. Each rotation has a template associated with it, agreed upon by the leaders of the involved rotations; they stipulate which half-days per week each resident will be in clinic. Residents have different clinic days on different rotations. The overall rotation schedule for each resident plus the template for each rotation creates a calendar detailing which residents are where each day of the year. For each inpatient and specialty rotation, a designated faculty physician at the Family Medicine Center works out scheduling agreements between the FMC and the other rotations. Inpatient and specialty rotations do not dictate residents' schedules; there is a give and take, an effort to satisfy the needs of all parties.

Access and continuity are the main scheduling priorities for the FMC. A forecasting model predicts appointment demand, and the scheduler works to provide capacity equal to 115% of that number.

RESIDENT ENGAGEMENT

Residents are deeply involved in understanding how quality metrics are computed and used for improvement. In the past, residents chose their own quality-improvement (QI) projects, but now, residents pick a project that is a clinic-wide priority. It is often a project to improve a metric that has not met its target. With their project on cervical cancer screening, for example, residents closed the number of care gaps by 1,200 in one year. Each year, clinic leadership gives residents a choice of metrics to focus on, and all of them work on that metric.

SUMMARY

For a primary care teaching clinic in a research-oriented academic health center with a large part-time faculty, the UNC Family Medicine Center has achieved impressive results by carefully implementing approaches to access, continuity, and clinical QI inspired by the data-driven culture that permeates the clinic.

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