

UCSF

Department of Family &
Community Medicine



AAMC

Tomorrow's Doctors, Tomorrow's Cures®

High-Functioning Primary Care Residency Clinics

Building Blocks for Providing Excellent Care and Training

High-Functioning Primary Care Residency Clinics

Building Blocks for Providing Excellent Care and Training

Thomas Bodenheimer, MD, Founding Director
Center for Excellence in Primary Care, University of California, San Francisco

Reena Gupta, MD, Assistant Professor
Division of General Internal Medicine, University of California, San Francisco

Kate Dubé, BS, graduate student
School of Social Welfare, University of California, Berkeley

Marianna Kong, MD, Academic Practice Transformation Liaison
Center for Excellence in Primary Care, University of California, San Francisco

J. Nwando Olayiwola, MD, MPH, Director
Center for Excellence in Primary Care, University of California, San Francisco

Kathleen Barnes, MD, Associate Physician in Family Medicine
Group Health Cooperative

Sara Syer, MS, PA-C, Practice Coach and Evaluator
Center for Excellence in Primary Care, University of California, San Francisco

Rachel Willard-Grace, MPH, Research Manager
Center for Excellence in Primary Care, University of California, San Francisco

Scott Shipman, MD, MPH, Director of Primary Care Initiatives and Workforce Analysis
Association of American Medical Colleges

Association of American Medical Colleges
Washington, DC

This is a publication of the Association of American Medical Colleges. The AAMC serves and leads the academic medicine community to improve the health of all. www.aamc.org.

This project was partially funded by the Josiah Macy Jr. Foundation.

© 2016 Association of American Medical Colleges. May not be reproduced or distributed without prior written permission. To request permission, please visit www.aamc.org/91514/reproductions.html.

Contents

| | |
|--|-----------|
| Preface | <i>iv</i> |
| Acknowledgments | <i>v</i> |
| Residency Programs Visited | <i>vi</i> |
| Executive Summary | <i>1</i> |
| Chapter 1. Introduction | 5 |
| Chapter 2. Conceptual Model: The Building Blocks of High-Performing Primary Care | 7 |
| Chapter 3. Building Block 1: Engaged Leadership | 11 |
| Chapter 4. Building Block 2: Data-Driven Improvement | 13 |
| Chapter 5. Building Block 3: Empanelment | 15 |
| Chapter 6. Building Block 4: Team-Based Care | 17 |
| Chapter 7. Building Block 5: Patient-Team Partnership | 23 |
| Chapter 8. Building Block 6: Population Management | 25 |
| Chapter 9. Building Block 7: Continuity of Care | 29 |
| Chapter 10. Building Block 8: Prompt Access to Care | 31 |
| Chapter 11. Building Blocks 7 and 8: Continuity of Care and Prompt Access to Care | 33 |
| Chapter 12. Building Block 9: Comprehensiveness and Care Coordination | 35 |
| Chapter 13. Building Block 10: Template of the Future | 37 |
| Chapter 14. Resident Building Block 1: Resident Scheduling | 39 |
| Chapter 15. Resident Building Block 2: Resident Engagement | 43 |
| Chapter 16. Resident Building Block 3: Resident Worklife | 45 |
| Chapter 17. Conclusion | 47 |
| References | 49 |

Preface

Cutting edge, innovation, transformation, disruption: these are words that leaders of academic medical centers use to champion their approach to biomedical research, the care of cancer patients, and their approach to the genomics and big data revolution. Not spoken are the words that often describe their ambulatory care practices, particularly those that serve as the teaching grounds for tens of thousands of residents and fellows each year: entrenched, conventional, old hat.

And yet, transformation is exactly what is needed to achieve the type of ambulatory care that saves lives in settings in which clinicians not only avoid burnout but also truly thrive. Transformation is required because the “hamster wheel of 15-minute visits” by a clinician as the strategy for delivering care is a holdover from an era when illness was predominantly acute, when other health professionals had modest educational backgrounds, and when all care had to emanate from the physician’s pen. Transformation is required because we must insist that patients served in these settings experience care that is consistently outstanding. The old excuse that “education is occurring here” to justify a lack of patient-centeredness and quality is not acceptable. Transformation is required because we cannot expect purpose-driven learners to enthusiastically pursue careers in primary or ambulatory care if their training occurs in settings where excellence in health care delivery is not the norm.

In this report, Bodenheimer and his colleagues seek to catalyze this needed transformation by describing the data-driven innovations of a group of leaders in residency education and ambulatory care. This collection of case studies illustrates the measurable success that can result when the 10 Building Blocks of Primary Care are applied to education in the ambulatory care environment. Like transformation in other environments, this work is hard work. Real change comes when experts in primary care partner with educational leaders with a goal of achieving both excellent patient care and excellent residency education in the same setting at the same time. The authors emphasize that success also requires deliberate institutional commitment and resources—just as it does when the transformative target is our research or tertiary care enterprises.

The purpose of medical education at all stages must be to reduce the suffering of our patients and improve the health of our communities. Bodenheimer and colleagues have provided real examples of innovative, disruptive, cutting-edge work by educational and clinical leaders that seeks to fulfill this purpose by rejecting the false dichotomy of either high-quality care or high-quality physician education. If all residency programs followed the lead of these pioneers, our institutional leaders could begin to champion their residency clinics as the jewels of their ambulatory enterprise. We will know we have succeeded in this transformation when faculty and institutional leaders choose to get their health care in residency clinics.

Catherine R. Lucey, MD
The Faustino and Martha Molina Bernadett Presidential Chair in Medical Education
Professor of Medicine
Vice Dean for Education
UCSF School of Medicine

Acknowledgments

We would like to thank Janhavi Athavale and William Poe, who assisted in the preparation of this report while they were medical students. We also express our great appreciation to the leadership of the 23 residency teaching programs and their associated clinics; our visits to these programs provided invaluable insights that made this report possible. We also thank the hundreds of faculty, residents, scheduling experts, clinic managers, and staff whom we met and learned from at the 23 sites. Finally, we thank the Josiah Macy Jr. Foundation for their generous support.

Residency Programs Visited

Baystate-Tufts Internal Medicine Residency, Baystate High Street Health Center, Adult Medicine, Massachusetts

Brigham and Women's Hospital Internal Medicine Residency, Advanced Primary Care Associates, South Huntington, Massachusetts

Crozer-Keystone Family Medicine Residency, Center for Family Health, Pennsylvania

Family Medicine Residency of Idaho (FMRI)

Greater Lawrence Family Medicine Residency, Massachusetts

Group Health Cooperative Family Medicine Residency, Washington

Harlem Residency in Family Medicine, Institute for Family Health, New York

Massachusetts General Hospital Internal Medicine Residency Program, Internal Medicine Associates

McGaw Northwestern Family Medicine Residency Program at Erie Humboldt Park Health Center, Illinois

Tufts University Family Medicine Residency Program at Cambridge Health Alliance, Massachusetts

University of California San Francisco (UCSF) Internal Medicine Residency Primary Care Program at San Francisco General Hospital (SFGH)

University of California, San Francisco (UCSF) Internal Medicine Residency Program at the San Francisco Veterans Administration Medical Center

University of Cincinnati Internal Medicine Residency

University of Colorado Family Medicine Residency

University of Colorado Pediatrics Residency

University of Kansas Family Medicine Residency

University of North Carolina Family Medicine Residency

University of North Carolina Internal Medicine Residency

University of Rochester Family Medicine Residency

University of Rochester Pediatrics Residency

University of Utah Family Medicine Residency

Virginia Tech Carilion Family Medicine Residency

Wright Center for Primary Care Internal Medicine Residency, Pennsylvania

Executive Summary

Residency teaching programs have two equally important missions: educating tomorrow's doctors and caring for today's patients. This report offers observations made in 23 family medicine, internal medicine, and pediatric resident teaching clinics around the United States. We found that several of those residency programs are demonstrating that good education for tomorrow's doctors requires excellent care for today's patients.

Currently, clinics that train the nation's future primary care physicians face major challenges. Faculty physicians and resident learners often spend only one to two half-days per week in clinic, making it difficult to provide continuity of care and prompt access for patients, who are often from underserved communities. Moreover, a "training gap" exists between the inpatient focus of many residency programs and the reality that the majority of health care occurs in the outpatient setting. Residents and medical students are less likely to enter ambulatory primary care careers as a result of poor experiences in teaching clinics.

The observations offered in this report are based on detailed site visits conducted from 2013 to 2015 by a team from the Center for Excellence in Primary Care (CEPC) at the University of California, San Francisco. The observations are organized according to the primary care improvement model—the Building Blocks of High-Performing Primary Care—which includes 10 features of good primary care.

Considerable variation was found in the extent to which residency programs have attended to these Building Blocks. Observations of programs in the process of transformation are provided in this report and are summarized here:

Building Block 1. Engaged leadership: Clinic and residency leaders work closely together and prioritize missions of both patient care and education—"the clinic is the curriculum."

Building Block 2. Data-driven improvement: Performance data on a range of clinical, operational, cost, patient, resident, and staff experience are available and transparent across clinic, team, and provider (including resident) levels. Measures are made meaningful and actionable for residents and teams. Resident schedules prioritize participation.

Building Block 3. Empanelment: Each patient chooses or is assigned to a faculty member or resident. Clear processes exist for reassigning panels when residents graduate.

Building Block 4. Team-based care: Clinicians and staff, including residents, always work on their team and are not shuttled back and forth from one team to another. These stable teams allow team members (faculty, midlevel providers, and nursing personnel) to provide continuity when residents are not in clinic. Co-location and huddles enhance a cohesive team culture and facilitate communication among team members. Small teams, or large teams subdivided into teamlets, allow patients to know their team members and team members to know their patients.

High-Functioning Primary Care Residency Clinics

Building Block 5. Patient-team partnership: Residents learn and practice self-management support skills and shared decision making. Patient language and literacy are assessed, and residents are taught how to work with interpreters and patients with limited health literacy.

Building Block 6. Population management: Residents have dedicated time to work with team members on panel management, health coaching, and care management of patients with complex health care needs.

Building Block 7. Continuity of care: Residents' schedules minimize length of time spent away from clinic. Scheduling algorithms prioritize scheduling patients with their primary resident provider or a team continuity provider if the resident is not in clinic.

Building Block 8. Prompt access to care: The clinic provides prompt access for new-patient, routine follow-up, and urgent same-day appointments, along with night, weekend, and telephone access. Same-day access is arranged with the resident primary provider or a team continuity member by keeping some appointment slots for each provider open until shortly before the day of the appointment. Having more full-time faculty and midlevel providers helps achieve both access and continuity of care.

Building Block 9. Care coordination: Reliable systems exist for coverage of EMR in-boxes and urgent patient issues when residents are away from clinic or on busy rotations; patients are carefully transitioned to new providers when residents graduate. Team members provide care coordination for specialty referrals and transitions after hospitalizations and ED visits.

Building Block 10. Template of the future: Resident schedules may include telephone calls and e-visits, video visits, group visits, and co-visits with other team members.

Resident Building Block 1. Resident scheduling: Resident schedules balance the priority of clinic and inpatient settings. Residents are scheduled in clinic regularly, predictably, and far in advance, with short intervals between clinic times, in order to maintain stable teams and provide patient continuity. Block scheduling eliminates the tension between simultaneous inpatient and outpatient duties. A small core of faculty physicians—dedicated to ambulatory primary care and resident teaching—are in clinic the majority of the time to lead clinic improvement.

Resident Building Block 2. Resident engagement: Residents learn about practice transformation through engagement in, and leadership of, sustainable clinic-improvement projects based on clinic priorities.

Resident Building Block 3. Resident worklife: Resident experience and burnout is assessed, and structures exist for actively responding to resident feedback. Well-functioning clinics create positive clinic experiences for residents and, thus, positive attitudes toward primary care careers.

High-Functioning Primary Care Residency Clinics

Several programs had taken six actions to accomplish this transformation:

1. Design resident schedules that prioritize continuity of care and eliminate tension between inpatient and outpatient duties.
2. Develop a small core of clinic faculty.
3. Create operationally excellent practices.
4. Build stable clinic teams that give residents, staff, and patients a sense of belonging.
5. Increase resident time spent in primary care clinic to enhance ambulatory learning and patient access.
6. Engage residents as co-leaders of practice transformation.

Though the challenges facing teaching clinics are formidable, this report demonstrates that residency programs can successfully undertake this transformation journey—a recognition that has inspired our study team. To improve patient care, enhance resident teaching, and attract medical students and residents to primary care careers will require that many more training programs pay close attention to the 10 + 3 Building Blocks.

CHAPTER 1

Introduction

Residency teaching programs have two equally important missions: educating tomorrow's doctors and caring for today's patients. This report offers observations made in 23 family medicine (FM), internal medicine (IM), and pediatric resident teaching clinics around the United States. We found that many of the programs visited demonstrate the principle that good education for tomorrow's doctors requires excellent care for today's patients.

Visiting programs that have harmonized the teaching and service missions has been an exhilarating experience for our team. We have seen first-hand that primary care residency programs and their associated clinics can transform themselves, paving the way for a solid foundation of primary care in the broader health care system.

Primary care teaching programs are beginning to undergo a shift in the balance between inpatient teaching and ambulatory teaching, moving toward creating a more central role for ambulatory care. This shift recognizes that current training priorities may not mirror the world beyond residency: in 2010, Americans made about 600 million primary care visits compared with 35 million hospital admissions.¹ While primary care physicians need to learn inpatient skills, the advent of the hospitalist movement has led to primary care physicians spending little or no time providing inpatient care.²

Innovation in society spreads from a few pioneer innovators to a handful of early adopters, finally reaching a tipping point when it becomes the norm.³ So it is with residency teaching clinics. We are early on this trajectory, with some primary care residency programs embracing a new balance between inpatient and ambulatory rotations, and others are on the way.

Why is such a transformation necessary?

Primary care practices in the United States face numerous challenges. An insufficient supply of primary care clinicians has resulted in poor access to services and rushed visits that fail to meet patients' needs. Clinicians, trapped on a hamster wheel of 15-minute visits, report stress and burnout. Overall, the United States has not invested sufficient resources into the primary care base of its health care system.⁴

For clinics that train the nation's future primary care physicians, these challenges are multiplied.^{5,6} It is widely recognized that there is a large gap between the ideal training environment and what currently exists around the country.⁷ For many of the clinics we visited, faculty physicians and resident learners spend only one to two half-days per week in clinic, making continuity of care difficult. For most clinics we visited, faculty and residents are away from clinic far more than they are present; as a result, building stable, cohesive teams is a formidable task. Complaining of poor access to care, patients—often from underserved communities—may not be able to reach anyone in the clinic who knows them and can address their needs.⁸ Moreover, a “training gap” exists between the inpatient focus of many residency programs and the reality that the majority of health care occurs in the outpatient setting.⁹ A 2005 paper estimates that only 13% of internal medicine residency training time is spent in ambulatory settings.¹⁰

High-Functioning Primary Care Residency Clinics

In one study, 52% of internal medicine residents reported that having inpatient and ambulatory responsibilities on the same day is stressful because it divides their attention and makes it difficult to focus on ambulatory patients.¹¹ In another survey, internal medicine residents reported that separating inpatient and outpatient responsibilities provides safer care, a better learning experience, and enough time to manage patients in both inpatient and ambulatory settings.¹²

Within primary care residency tracks, 93% of the residents report interest in primary care before entering residency, but only 54% maintain that interest after completing their residency.¹³ This suggests that their inpatient and specialty rotations are more enjoyable than their time in the primary care clinic.¹³ A survey of internal medicine residents from three academic training programs found that their experience in continuity clinic caused them to be less likely to enter a primary care career.¹⁴ In another study, 33% of medical students ranked family medicine as a likely residency preference, yet after experiencing their family medicine clerkship, only 16% pursued family medicine residency; the most influential negative factor driving their decision was their clerkship experience.¹⁵

At one of our site visits, a faculty preceptor explained: “When I started in the clinic . . . there were too many patients, and we couldn’t take good care of them. The culture of leadership was, ‘Clinic is what it is, and there’s nothing we can do about it.’ . . . [The residents] always had someone sicker in the hospital they needed to go back to, their pagers would be going off throughout clinic. . . . Clinic was leftovers—the action was in the hospital.” Another medical educator, deploring the current state of medical education, wrote in 2015: “So let me begin by stating what some may consider obvious, and others, a heresy: Patient-centered care and medical education—as currently practiced—cannot coexist.”¹⁶

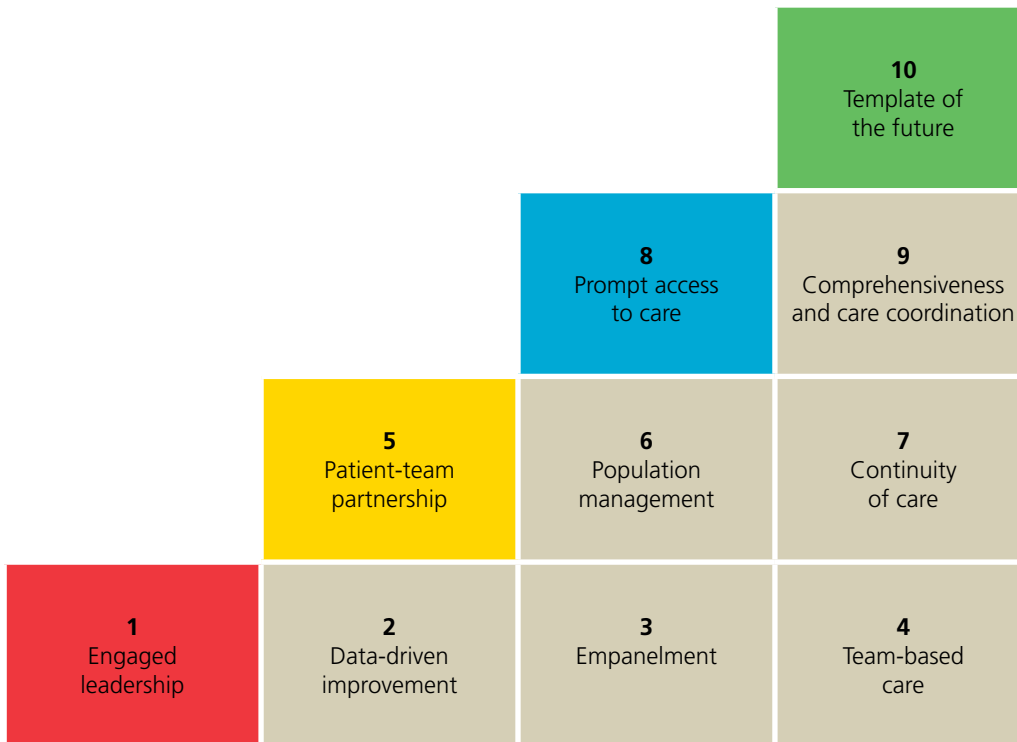
This report offers observations made in 23 family medicine, internal medicine, and pediatric residency teaching clinics around the United States. The observations build on the 2010 report of the Association of American Medical Colleges that described innovations in primary care teaching clinics.¹⁷ We hope to show that several residency programs have demonstrated that *providing excellent patient care is the foundation of excellent graduate medical education*. In the new paradigm, education and service to patients are inseparable.¹⁸

CHAPTER 2

Conceptual Model: The Building Blocks of High-Performing Primary Care

From 2009 to 2012, members of the Center for Excellence in Primary Care, University of California, San Francisco Department of Family and Community Medicine (CEPC) and colleagues performed site visits to more than 20 nonteaching primary care practices that were named by primary care experts as highly regarded practices.^{19,20} From the observations made at these practices, the CEPC team proposed the 10 Building Blocks model to describe key features of high-functioning primary care (Figure 1).

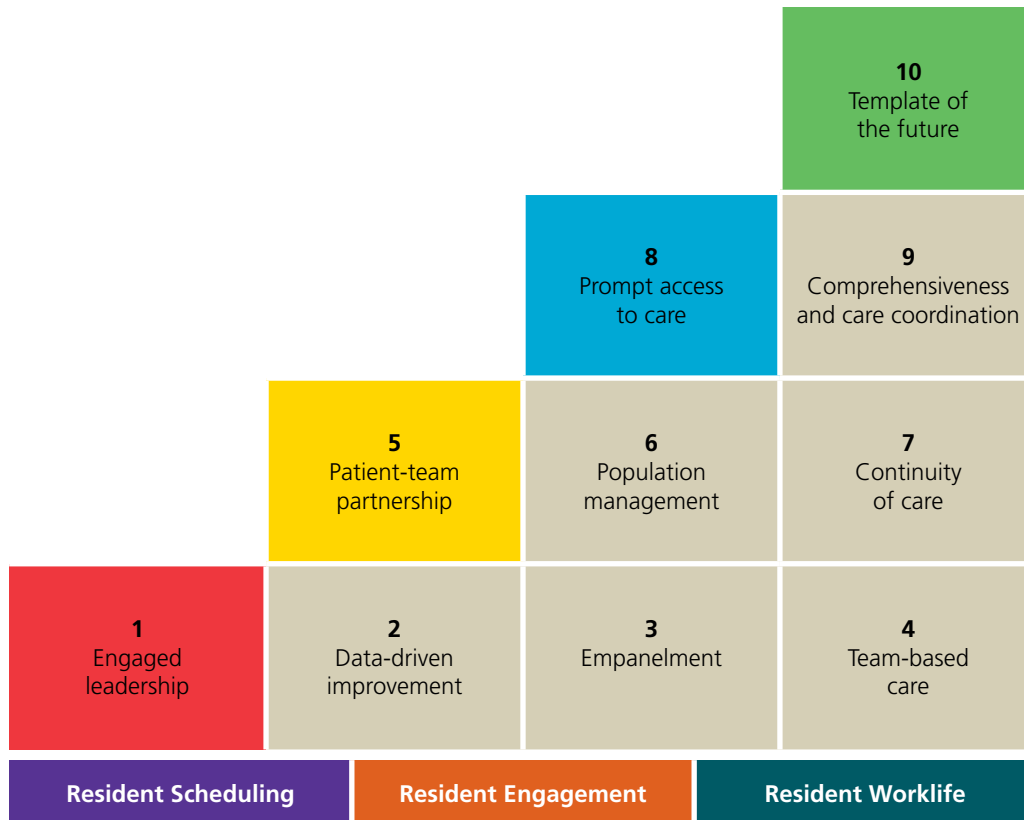
Figure 1. The 10 Building Blocks model for nonteaching clinics.



High-Functioning Primary Care Residency Clinics

In this report, we offer observations from a subsequent set of visits to 23 primary care residency teaching clinics. We use the Building Blocks as the report’s organizing principle. In the course of analyzing themes from the teaching clinic visits, we added three Building Blocks specific to residency programs, as shown in Figure 2.

Figure 2. The 10 + 3 Building Blocks model for resident teaching clinics.



Terminology

In this report, the word *clinician* refers to physicians, nurse practitioners, and physician assistants—those members of the health care team authorized to diagnose, treat, and bill for their services. *Physicians* refers to both residents and faculty. First-year residents are R1s, second year, R2s, and third year, R3s. *Clinic staff or team members* refers to both professional—for example, registered nurses (RNs), behavioral health providers, pharmacists, licensed clinical social workers—and unlicensed personnel—for example, medical assistants (MAs), receptionists, community health workers, and patient navigators.

The residency programs we visited exhibited a spectrum from lower to higher performance. We use the phrase *transforming practices* to indicate those that have implemented a number, but not necessarily all, of the 10 + 3 Building Blocks and are uniting the educational and patient care missions. All the programs we visited are undergoing a process of improvement.

High-Functioning Primary Care Residency Clinics

Methods

In 2013, the Center for Excellence in Primary Care (CEPC) created a study team to observe existing internal medicine, family medicine, and pediatric residency programs and their associated clinics, looking for characteristics associated with high-quality patient care and resident experience. The CEPC team included two faculty physicians in family medicine, one faculty physician in general internal medicine, one academic pediatrician, a research director, two research associates, one physician assistant, two family medicine residents, and two medical students.

Between May 2013 and May 2015, members of the study team performed 23 site visits to residency teaching clinics. The team used a detailed guide adapted from the guide used in CEPC's study of nonteaching practices. Each site visit, performed by one or two members of the team, involved meeting with residency and clinic leaders, residents, faculty, and clinic staff in addition to observing the clinic floor by shadowing front-line clinicians and staff. Site visits lasted one to two full days. The study was reviewed by the UCSF Committee on Human Research (CHR) and deemed exempt.

The first nine sites were selected based on convenience sampling; they were located in areas where study team members lived or were visiting. At that time, we were looking for a variety of programs to observe rather than high-performing clinics. For the second round of site visits, we applied reputational sampling, reaching out to 17 national authorities in primary care medical education and asking them to list "high-performing" residency programs for patients and learners. We made phone calls to programs identified by two or more of the experts, asking program leaders a series of standard questions touching on such issues as access, continuity of care, and team formation. Fourteen programs were chosen for the next round of site visits. For all 23 programs, we requested performance data to determine whether highly regarded programs were truly high-performing.

We prepared detailed write-ups on all site visits using the Building Blocks as the organizing principle. From the site-visit write-ups, the study team identified three additional Building Blocks (Figure 2). The study team analyzed the site-visit write-ups and staged each program as traditional, early redesign, or transforming for each Building Block. *Traditional* programs for a given Building Block had not yet implemented the fundamental features of that Building Block. *Early redesign* programs organized their teaching programs using the hospital first–clinic second paradigm but were moving in the direction of clinic first. *Transforming* programs had goals that included making great strides toward the clinic first paradigm within one or more Building Blocks. The study team reached consensus before assigning each program to a stage for each Building Block.

This report describes the characteristics of traditional, early redesign, and transforming programs and clinics for each Building Block. For some programs that we felt were transforming in one or more Building Blocks, we present case highlights. We were not able to include case highlights for all 23 programs visited.

Results

Of the 23 programs visited, 12 are associated with family medicine, 8 with internal medicine, and 3 with pediatrics residency programs. Twelve are situated within academic medical centers; 10 in community settings, including 3 teaching health centers; and 1 in an integrated delivery system. Ten are in the eastern United States, 3 in southern states, 3 in central states, and 7 in western states.

CHAPTER 3

Building Block 1: Engaged Leadership

Engaged leadership is the first and foundational Building Block; our site visits found that without such leadership, the other Building Blocks do not fall into place. Breaking down the silos that may separate residency and clinic leadership is one step that can harmonize the resident education and patient care missions.²¹⁻²³ Engaged leadership at transforming programs is described in two case highlights.

Tufts University Family Medicine Residency Program at Cambridge Health Alliance (Tufts-Cambridge Health Alliance)

The program's goal for resident education is "developing leaders in the health care revolution." The management team—medical director, nurse practice administrator, and practice manager—of the teaching clinic, Cambridge Health Alliance at Malden, works closely with the residency leadership team. Each week, the two leadership teams—clinic and residency—meet together as the Operations Committee, the key leadership body for the clinic and the residency. The Operations Committee reflects the need for clinic and residency to understand each other, value each other's importance, and address the tensions that inevitably exist between the resident education and patient care missions.

Working with overall Cambridge Health Alliance leaders, the Operations Committee decided to elevate the family medicine outpatient experience above inpatient rotations ("clinic first"). Family medicine residents and faculty spend far more time in the clinic than do physicians in traditional academic residencies, promoting the concept that "the clinic is the curriculum."

The Operations Committee sets concrete clinical, operational, patient-experience, and staff-experience goals with input from the Practice Improvement Team (PIT), a committee representing front-line groups in the clinic. The PIT brings ideas to the Operations Committee and fosters leadership at all levels of the clinic. Meeting weekly for two hours, the PIT is chaired by a faculty physician and includes a physician assistant, an RN, an MA, a receptionist, two permanent residents on the PIT for a two-year commitment starting in their R2 year, and R1-observing residents, who attend PIT during their practice-improvement rotation. Two patient representatives are nominated by clinic staff and coordinate with the clinic's Patient Advisory Council. One Operations Committee member sits on the PIT to coordinate between the two bodies. PIT meeting facilitators rotate and are mentored by the PIT chairperson, with each PIT member facilitating for 10 weeks as leadership training. Through their participation in the PIT, residents gain leadership experience and skills.

Family Medicine Residency of Idaho

FMRI is a community-based teaching health center, 50% of whose governing board are patients engaged in clinic policy at monthly meetings led by the program's president and CEO, chief medical officer, and chief quality officer. The governing-board patients attend the yearly strategic planning retreat and inform all FMRI patients about the clinic's transformation efforts.

FMRI also captures patient voices through an active patient advisory council, which at one point brought to light patients' frustrations with telephone access. The clinic leadership studied the problem

High-Functioning Primary Care Residency Clinics

and made major improvements in the phone system. FMRI's net promoter score (the likelihood that patients would recommend the clinic to a friend) is 97, an impressive number and a testament to the involvement of patients at FMRI.

For leadership training, all R3s are required to serve on boards or committees of hospitals, health organizations, and clinics (e.g., board of directors of the Idaho Academy of Family Physicians), and residents are involved in all clinic leadership meetings. They learn legal patient advocacy skills, write resolutions to bring to the Idaho Medical Association, and learn about the state's legislative process. Residents have testified before the legislature, and seven of them have written bills that have become law in the state of Idaho. One resident stated that "faculty instills in us that being a physician is not just about providing patient care, but it is also about being an advocate."

Building Block 1: Features of Engaged Leadership

- Clinic and residency leaders work closely together, with aligned priorities and regular communication.
- Leadership prioritizes missions of both patient care and education; "the clinic is the curriculum."
- Leadership creates a change-positive culture with involvement from all levels: residents, faculty, staff, and patients.

CHAPTER 4

Building Block 2: Data-Driven Improvement

A survey of 185 internal medicine teaching clinic directors found that 80% set goals based on performance data, but in only 9% of clinics are staff aware of the data. Fewer than 20% used data-driven plans for resident quality improvement.^{15,16} Our site visits uncovered wide differences among practices in how data are used in teaching clinics, with some clinics lacking the information technology infrastructure needed to generate and report performance data. Other clinics create accurate data but fail to involve residents, faculty, and staff in discussing the data and using it to drive improvement. Data-driven improvement at transforming programs is described in three case highlights.

Wright Center for Primary Care Internal Medicine Residency

At the Wright Center's Mid Valley Practice, a teaching health center, clinic leaders have created a strong infrastructure for robust data collection. The clinic has a data specialist who works with a technology-savvy physician to lead quality initiatives and empanelment-based overall population management. Residents and faculty are included in the EMR-driven, team-based empanelment of the population being served. The clinic tracks and reports metrics on care quality, clinical outcomes, EMR meaningful use, and financial and process compliance data through online Performance Assessment and Competency Evaluation, or "PACE," report cards available to all clinicians, including faculty and residents, MAs, and clinical and administrative staff. Reports of the performance measures for individual clinicians, residents, and teams are run and shared electronically each month. Monthly summative team and overall clinic reports are reviewed at the weekly clinic-wide huddle and visibly posted in the clinic.

For faculty, annual bonuses are based on the number of months they meet PACE card "gateway to bonus" criteria, including professionalism (e.g., number of completed versus uncompleted charts and weekly meeting attendance); finances (e.g., productivity, Medicare preventive visits, and transition-of-care visits); growth (e.g., new patients seen, percentage of appointment slots booked, and number of no-shows); clinical performance (e.g., number of diabetic patients with self-management support, smoking-cessation counseling, LDL-cholesterol and HbA1c checks, foot exams, pneumonia and flu shots, and annual eye exams); and EMR-meaningful-use metrics (e.g., e-prescribing, updated medication lists, and patient-portal use). Plan-do-study-act (PDSA) cycles—a commonly used rapid-improvement process—are done to improve underperforming team and clinic metrics. Each resident is required to participate in six total team-based, faculty-supervised PDSA cycles per year, with at least three in the ambulatory setting, piloting a change with one or two clinicians or teams and spreading successful changes to the entire clinic.²⁴ These activities are tracked within a homegrown PDSA tracking system. Residents focus PDSA activities on clinical outcomes and workflow improvements that address the needs of the population served.

University of Cincinnati Internal Medicine Residency

On a monthly basis, the clinic tracks performance metrics across the domains of clinical quality, access, operations, utilization, cost, staff, and patient satisfaction. Clinic and individual clinician data—including residents—are distributed each month, and clinic-wide data are posted prominently. A culture exists that values, rather than fears, discussions of performance variation among clinicians and teams.

High-Functioning Primary Care Residency Clinics

Data relevant to each weekly meeting agenda are projected onto a screen during the meeting, presented in a transparent, nonjudgmental manner, normalized with humor, reported for individual team and resident panels, and discussed to identify improvement opportunities. Residents participate in an annual “Defense of the Measures,” presenting and discussing the evidence base for various metrics and deciding on core metrics for the clinic. Residents choose metrics of focus, and their performance on these metrics is assessed each year.

At weekly meetings of all clinic staff, led by residents, the highest performers for a particular metric are highlighted: “How did you and the RN on your team accomplish this?” “What are best practices we could spread clinic-wide?” Residents and staff lead the data-driven improvement process with the management team offering guidance.

University of Colorado Pediatrics Residency

Performance measures are different for pediatrics compared with those for adult patients. Examples of metrics tracked and reported on a monthly basis include immunizations, counseling on secondhand smoke, asthma action plans, healthy weight program documentation, ages and stages questionnaire documentation, 20-month bundle of services and screenings, hand hygiene for staff, actual and near-miss safety events, employee and patient satisfaction, and resident-patient continuity of care. Performance is reported in the aggregate and by team; residents receive feedback on their performance. Residents engage in continuous quality-improvement projects supplemented by formal training in quality-improvement skills and tools. At the end of these projects, residents present a poster showcasing their work and its implications for the clinic.

Building Block 2: Features of Data-Driven Improvement

- Robust, clear data are available and transparent across clinic, team, and provider (including resident) levels.
- Data include a range of clinical, operational, cost, patient, and staff experience, including resident experience.
- Practice-improvement goals related to the metrics are clearly defined.
- Measures are made meaningful and actionable for residents and teams.
- Meeting structures exist for discussing and improving performance.
- Resident schedules prioritize participation.

CHAPTER 5

Building Block 3: Empanelment

Empanelment means linking each patient to a primary care clinician and, ideally, to a stable team.²⁵ The basis for patient-clinician continuity, empanelment is the substrate for the longitudinal therapeutic relationship essential for good primary care. Clinicians know their patient panel, and patients know who their primary care clinician is. Empanelment enables the practice to calculate adjusted panel size, which determines whether each clinician and team has a reasonable balance between patient demand for care and the capacity to provide that care.²⁶ Empanelment also allows practices to balance the workload among clinicians and teams. Finally, defined panels provide a denominator for performance measures at the clinician and team level.

A relatively simple concept, empanelment becomes complex in residency clinics.²⁷ Leaders of teaching practices have different ideas about whether residents should be empaneled and about the relationship between faculty and resident panels. A 2007 survey of 185 internal medicine teaching clinics found that only 47% had procedures to link patients to personal physicians.²² Programs with carefully implemented empanelment processes are described in two case highlights.

University of Colorado Family Medicine Residency

The resident teaching clinic, AF Williams Family Health Center, has empaneled more than 90% of its 9,500 patients to a primary care clinician. Patients who have not been seen for 36 months are dropped from panels. Patients are empaneled to both faculty physicians and residents; targets for resident-panel size are, for R1, 75; R2, 200; and R3, 400. The empanelment process optimizes balance in patient complexity. R1s are assigned panels with a variety of medical diagnoses and patient ages to ensure a breadth of learning opportunities. The empanelment process, which never stops, addresses the reassignment of patients when R3s leave and makes judgments about which patients are transferred to incoming R1s versus other residents or faculty (see Chapter 12: Building Block 9 for more on resident transitions). Panel sizes are assessed yearly, and the empanelment process is reviewed regularly by the practice manager and discussed with the management team.

Tufts-Cambridge Health Alliance Family Medicine Residency

All patients at the Malden resident teaching clinic are empaneled to an attending physician or resident but not to physician assistants (PAs). The clinic has hired many PAs to improve patient access; PAs do not carry their own panels and are chiefly used to see patients of their team's physicians who are not in clinic that day. The practice manager reviews the empanelment process on a weekly basis, allowing work to be fairly distributed among physicians and ensuring that denominators for performance measures are accurate. Panels are not risk-adjusted, but high-utilizing patients are tracked to distribute them fairly, thereby preventing a few physicians from having too many complex patients.

The panel-size target is about 1,425 patients per 1.0 FTE faculty physician, adjusted for the percent FTE the physician works. Panels may be increased if the physician is directly supported by a PA. The compensation formula for physicians rewards higher panel size. R1s have 50 patients on their panels, and R2s and R3s have 400. Data about actual and ideal panel size are tracked and distributed quarterly

High-Functioning Primary Care Residency Clinics

to each provider (including residents) and team. An attempt is made to equalize the panels of the teams. Patients are dropped from panels if they have not attended the clinic in 24 months. If panels are too large, physicians can request that their panels be closed.

Building Block 3: Features of Empanelment

- Patients are empaneled to faculty and residents.
- Residents regularly review their panels.
- Resident and faculty panel sizes are tracked and adjusted for level of need.
- Clear processes exist for reassigning panels when residents graduate, with protocols to ensure that patients do not get lost in transition.

CHAPTER 6

Building Block 4: Team-Based Care

A full-time clinician caring for a typical panel of 2,500 patients without a team would spend 17.4 hours per day providing all recommended acute, chronic, and preventive care.²⁸ It is not surprising that many primary care clinicians report a high level of burnout.²⁹ Given the growing shortage of primary care clinicians, the gap between the population's demand for primary care and primary care's capacity to meet this demand can only be closed by creating teams of nurses, pharmacists, and behavioral health professionals who add capacity to see more patients without increasing clinician stress.^{30,31} Moreover, nonlicensed team members, such as medical assistants, can provide health coaching, panel management, and EMR documentation (scribing), which can also save clinician time.³²

Some nonteaching practices have created high-performing teams that share the care among team members.^{19,33} These practices pay attention to nine elements of team-based care that describe both a stable team structure and a collaborative team culture.³⁴ Depending on practice size, the team structure may include two or three teamlets (clinician and one or two clinical assistants—usually MAs—who always work together) surrounded by a larger team (for example, nurse, pharmacist, behavioral health professional, and receptionist). Patients are empaneled to their teamlet; other team members assist patients with needs that teamlets alone cannot fulfill.³⁵

Nine Elements of Team-Based Care

1. Stable team structure
2. Co-location
3. Sharing the care
4. Defined roles with training and skills checks
5. Standing orders and protocols
6. Defined workflows and workflow mapping
7. Staffing ratios adequate to facilitate new roles
8. Ground rules
9. Team communication: team meetings, huddles, and minute-to-minute interaction

Residency teaching clinics face challenges in attempting to create a stable team structure and collaborative team culture.³⁶ In a 2007 survey, the overall sentiment of internal medicine clinic directors was that true teamwork did not exist.²² Yet patients of teaching practices want the same small group of people available to them when they need care, and we found that residents feel more comfortable working with the same small group each time they come to clinic. Transforming practices have implemented many elements of high-performing teams, including a stable team structure and collaborative team culture. The case highlights presented here provide examples of one or more of the nine team-based-care elements.

High-Functioning Primary Care Residency Clinics

Stable Team Structure: Greater Lawrence Family Medicine Residency

Greater Lawrence, a teaching health center, reduced the number of primary care faculty from 40 very-part-time physicians to 14 faculty members deeply engaged in clinic improvement. Faculty physicians are the anchors of the teams, each having three to five patient care sessions per week plus one to two precepting sessions.

Resident schedules are not dictated by hospital rotation demands, and a concerted attempt is made to have residents in clinic the same mornings or afternoons every week. The same number of residents are in clinic almost every day, and residents work on the same team throughout their residency years. Scheduling residents this way allows the clinic to create stable teams visible to patients and welcoming to residents. The master scheduler explained, “We know well in advance which days and hours residents are in clinic.” Leaders of hospital and specialty rotations are told: “If you want a resident, it has to be Tuesday afternoon when they are not needed in clinic; if that doesn’t work for you, then you don’t get a resident.”

The clinic, most of whose patients are Spanish-speaking, has four color-coded teams: Amarillo, Rojo, Azul, and Verde. Because the teams are large, each is divided into two mini-teams, each with about two faculty and three residents, one MA, and one RN. A nurse practitioner supports two mini-teams. One faculty member is the team leader. Each team has one front-desk patient services representative. Team members are rarely shifted away from their home team. Walk-in patients unable to be seen by their own clinician are usually seen on that clinician’s mini-team.

While MAs work with several clinicians, residents and faculty work with the same MA 75–80% of the time. Residents develop close relationships with the MA they work with, and graduating residents often honor the MA they have worked with throughout their residency. Residents are also paired with a faculty preceptor on their team.

Co-location: Baystate-Tufts Internal Medicine Residency

The Baystate High Street Health Center clinic has created five sister-team pairs, Pink/Orange, Blue/Green, Gray/Red, Burgundy/Lilac, and Yellow/Purple. Each sister-team pair shares one co-located space, with the teams’ colors and art work on the walls. Pink Team members do not see patients when the Orange Team sees patients, and so forth. The co-located space is small and cozy, seating eight people (faculty, residents, MAs, and the team RN) maximum. The atmosphere is busy but quiet, with team members constantly interacting with each other about the patients they are seeing. During one day per week, each of the 10 teams has the majority of their residents and their faculty preceptor scheduled simultaneously to see patients; this “team day” is a time when the entire team works together in its co-located space, building team cohesion. As one team RN put it, “Team day is hectic, but I love it.”

Co-location: Crozer-Keystone Family Medicine Residency

Clinicians including faculty, residents, MAs, and behavioral health providers are all co-located in a workroom. The workroom has six work stations, one for each teamlet, with the clinician and MA sitting next to each other. While clinicians are in the workroom during patient care times, a separate precepting area, connected to the workroom, is available. Residents were heavily involved in designing the work stations, and they feel that co-location has greatly improved communication among clinicians and staff.

High-Functioning Primary Care Residency Clinics

Sharing the Care: Group Health Cooperative Family Medicine Residency

Group Health has defined team member roles and enhanced the roles of MAs, nurses, and pharmacists to contribute meaningfully to the care of the patients. Residents spend 30% of total residency time in the primary care clinic and work with the same MA most of the time in a teamlet structure. MAs remain linked to the same panel of patients when residents graduate and, therefore, create longitudinal, continuous relationships with these patients, which helps mitigate the inherent turnover of residents as they leave the clinics after three years. MAs care for a panel of patients and identify health maintenance, immunizations, and chronic care services needed by those patients. They reach out to patients (through the secure patient portal, the phone, or letters), conduct medication reconciliation, perform follow-up blood pressure checks, and generally assist the clinicians they regularly work with.

Licensed practical nurses (LPNs) triage incoming phone calls and electronic messages, receiving 50 to 100 phone calls and 50 to 100 electronic messages on an average day. They answer patient questions or direct questions to their team's RN or physician. Transferring the triage function to LPNs frees RNs to provide chronic disease care.

RNs develop care plans with clinicians that allow the RNs to adjust medications for diabetes, hypertension, and asthma. RNs ensure that chronic and preventive services are up-to-date, co-manage pre-natal patients with residents, and conduct outreach to patients recently seen in the emergency department or who were hospitalized. Complex-care manager RNs are specialized to care for the top 5% highest-utilizer patients. They are trained in motivational interviewing, have 45 to 80 patients on their panel, and interact with their patients through visits, phone calls, and the patient portal.

Pharmacists manage the care of some patients with diabetes, hypertension, and coronary heart disease, providing health coaching and making medication changes that follow physician-written standing orders. Residents consult with pharmacists for medication advice.

Behavioral health specialists are available for warm handoffs, after which they can help with the psychosocial aspects of patients' care. Social workers help patients with financial concerns, do crisis management, and assist complex-care-management RNs with the psycho-social-economic needs of high-utilizing patients.

Residents learn to partner with other team members during their initial orientation to the clinic, shadowing team members to understand their roles. Residents work consistently with the same team members throughout their three years. The culture of sharing the care and interprofessional collaboration is fostered throughout their training. Residents graduate with the skills to practice within high-functioning teams.

Staffing Ratios Adequate to Facilitate New Roles: University of Utah Family Medicine Residency

Increasing staff:clinician ratios allows clinics to share the care with nonclinician team members.^{37,38} While this program has undergone recent changes, at the time we visited the resident teaching clinic at the University of Utah's Sugarhouse Health Center, it had a target MA:physician ratio on any given day of 2:1, a goal that was accomplished 80% of the time for faculty and R3s, and less often for R1s and R2s. The higher number of MAs allows them to function as scribes in the "Care by Design" model.

High-Functioning Primary Care Residency Clinics

MAs initiate the visit by taking the patient's history—using complaint-specific templates—and entering the history into the electronic medical record. The physician (whether faculty or resident) enters the exam room, reviews and expands the history as needed, and performs the physical exam, calling out the findings so that the MA scribe can enter those findings into the EMR. The physician then tells the MA scribe which labs, imaging, referrals, and prescription orders to enter into the EMR, signs those orders, and leaves the room so that the MA can review the care plan with the patient. The Care by Design model has increased clinic productivity, revenues, patient and physician experience, clinical outcomes, and MA engagement.³⁹ R3s stated that they love the scribes' assistance and wonder how they will survive without scribes when they graduate.

Standing Orders: University of Colorado Family Medicine Residency

In 2012, the program leadership authorized RNs to refill expired prescriptions for more than 160 medications without clinician approval, thereby relieving clinicians of a time-consuming function. The protocols, revised in 2014, include refill criteria, labs needed, and the number of months refills are allowed for different medications. The protocols include such general rules as these:

- Prior to authorizing a refill request, the RN will review the patient's chart for allergies and drug intolerance.
- Prior to authorizing a refill request, the RN will review the six rights of medication administration: right patient, right medication, right dose, right route, right time, and right documentation.
- Recommended lab values and vital signs must be within normal limits or as defined in the protocols' "requirements" section.
- Patients not seen in the last 12 months may have one 30-day refill or one 90-day mail-order refill.

Team Communication: University of California San Francisco Internal Medicine Residency Program at the San Francisco Veterans Affairs Medical Center

In spring 2010, primary care clinics at San Francisco Veterans Affairs (SFVA) began phasing in the VA-mandated Patient-Aligned Care Teams (PACTs). A teamlet—composed of a registered nurse (RN), a licensed vocational nurse (LVN), and a medical clerk—works with one or more primary care providers to care for a patient panel. In 2011, eight trainee triads (two UCSF internal medicine residents and one nurse practitioner student) were added to eight teamlets. On each clinic day, the trainee triads huddle with their team members to discuss the day's patients, those scheduled for upcoming weeks, and those requiring telephone contact, such as recent hospital discharges. A checklist is used to ensure productive huddles. Huddle coaches (physician and nurse practitioner preceptors)—using the checklist—provide feedback to the huddle participants. Over a six-month period, the Team Development Measure, which addressed cohesion, communication, and clarity of roles and goals, improved. The huddle-coaching program fully integrates residents into clinic teams.⁴⁰

Team Communication: McGaw Northwestern Family Medicine Residency Program at Erie Humboldt Park Health Center

The clinic is organized into nine teams labeled by color. Each team is composed of one faculty attending, one resident in each year, and one full-time MA. Teams are paired, with each pair of teams also having a dedicated RN, a second part-time MA, a behavioral health provider, and a front-desk receptionist. In addition, a dedicated referral coordinator and lab technician support several teams.

High-Functioning Primary Care Residency Clinics

Teams meet monthly, starting with an all-staff meeting and breaking down into smaller meetings for each team. Residents were driving forces in establishing regular team meetings. Each team reviews panel lists with a focus on different conditions (e.g., asthma or hypertension) and develops a plan to improve the team's clinical quality measures. Meetings have a timekeeper and a meeting coach to provide a recap and feedback at the end of the meeting. Residents are actively involved in team meetings unless they are on inpatient rotations.

Residents spearheaded the institution of 15-minute huddles before each half-day session. Residents and the assigned MA for the session review the patient schedule together. In some huddles, the resident reviews (scrubs) the charts before the huddle and goes over tasks to be performed by the MA for each patient. In other cases, the MA scrubs the charts and leads the huddle. One resident confirmed that "huddles shave minutes off each patient visit and drastically improve the session."

Building Block 4: Features of Team-Based Care

- Clinicians and staff, including residents, always work on their team and are not shuttled back and forth from one team to another.
- Moving from a clinician-centered paradigm to a share-the-care philosophy allows all team members to contribute to the health of the team's patient panel; training and standing orders are needed to empower all team members.
- Stable teams allow team members (NPs, PAs, RNs, and MAs) to provide continuity when residents are not in clinic.
- Co-location and huddles enhance a cohesive team culture and facilitate communication among team members.
- Teams are visible to patients: "I'm a Blue Team patient." Patients always receive care from their team, which turns large impersonal clinics into the smaller, familiar units that patients prefer.
- Small teams, or large teams subdivided into teamlets, allow patients to know their team members and the team members to know their patients.

CHAPTER 7

Building Block 5: Patient-Team Partnership

An effective patient-team partnership is one that harnesses the expertise of patients and care teams. Clinicians and care teams bring expertise in evidence-based care, diagnosis, and treatment, while patients bring to bear expertise about their values, strengths, and preferences. Partnerships engage patients as informed, active participants in their care, encouraging them to participate in clinical decisions that respect their personal goals. Some programs we visited have implemented transforming portions of this Building Block, though a completely transformative model was not observed.

Baystate-Tufts Internal Medicine Residency

The Baystate High Street Health Center's Adult Medicine Clinic has an EMR-based decision-support system for evidence-based care, and residents attend evidence-based morning rounds with brief presentations of patients (background) together with short literature reviews related to those patients (foreground). Residents learn shared decision-making and communication skills in a simulation lab. A mindfulness curriculum helps residents address their feelings about difficult patients. With up to 50% of patients being non-English-proficient, with Spanish as their primary language, five full-time certified Spanish interpreters are stationed in the clinic and available at a moment's notice. When an appointment is booked for a Spanish-speaking patient with a clinician who does not speak Spanish, the appointment is also booked with one of the interpreters. Trained interpreters in most other languages are also booked in advance with patients and families who have limited English proficiency and/or are deaf or hard of hearing.

Wright Center for Primary Care Internal Medicine Residency

The Wright Center assesses health literacy for every new patient using the REALM-SF (Rapid Estimate of Adult Literacy in Medicine—Short Form), with screens set up in every exam room. MAs check to make sure that all patients have completed the literacy assessment and create a Health Literacy Score Chart Alert visible to all providers. The Wright Center also has a patient-goal tracker in the EMR; MAs, faculty, and residents can review which goals were set at the previous visit, and they are expected to guide further conversations with patients about how they are progressing in reaching their goals and whether new goals should be set. All faculty, residents, and clinic staff have been trained in self-management support and shared decision making, such as how to use relevance and readiness rulers for behavior change including weight management, cardiovascular risk reduction, and tobacco cessation.

University of Colorado Family Medicine Residency

The teaching clinic has two health coaches who are psychology graduate students, trained in motivational interviewing, shared decision making, and self-management goal-setting. Residents and faculty are trained in these coaching techniques, and the faculty try to reinforce their use by residents with patients. The clinic is developing shared care plans with patients, enabling patients and families to be active participants in their care.

Building Block 5: Features of Patient-Team Partnership

- Residents are taught about evidence-based care, guidelines, and a culture of inquiry.
- Residents learn and practice self-management support skills and shared decision making.
- Patient language and literacy are assessed, and residents are taught how to work with interpreters and patients with limited health literacy.

CHAPTER 8

Building Block 6: Population Management

In addition to caring for individual patients, primary care must rise to the challenge of taking a population-based approach concerned with the health of all patients. *Population management* refers to the risk stratification of patient panels and the division of panels into at least three groups of patients: 1) healthy patients and those with chronic conditions who need periodic preventive services or chronic disease tests (which includes all patients), 2) patients with one or two chronic conditions in poor control who need additional services such as health coaching, and 3) patients with multiple diagnoses who need intensive complex-care management.

The term *panel management* in this report refers to Group 1—identifying and closing care gaps (overdue services) for chronic and preventive care.⁴¹ A survey of 185 internal medicine teaching clinics found that only 24% had a registry used for tracking patients needing preventive services.²² Patients in Group 2 benefit from health coaching, which helps patients gain the knowledge, skills, and confidence to become informed, active participants in their own care.⁴² Diabetes patients working with health coaches, whether the coaches are MAs or other patients with diabetes, have been shown to have better outcomes than patients without health coaches.^{43,44} A survey of 185 internal medicine teaching clinics found that only 23% of them assessed patients' self-management capabilities.²² Complex-care management for Group 3 patients addresses the needs of patients who are medically and psychosocially complex and high utilizers of expensive services. Teams headed by RNs and/or social workers have been shown to improve care and reduce costs for complex patients.⁴⁵ Here are three case highlights on transforming programs for this Building Block.

Group Health Cooperative Family Medicine Residency

Patient registries exist for all chronic diseases and preventive care and are reported, accessible and searchable by provider panel on the EMR dashboard (the first screen after logging in). The dashboard reports the provider's metrics on preventive, chronic, and system-based care, and members of the team can easily drill down to patient-specific data in each of these areas. All team members have access to these registries and use them for "in-reach" and "outreach" work. Panel management in-reach and out-reach are standard features of care. For in-reach, MAs scrub charts before the patient visit to uncover care gaps and report on those care gaps in the daily huddle. The MA enters orders into the EMR to close care gaps; the clinician sends off the order. For out-reach, the team identifies patients overdue for chronic- and preventive-care services through the EMR dashboard, and MAs contact (via letter, phone, and/or email) patients on their panel and ask them to come to the lab, the mammography suite, or the clinic for care (such as for Pap smears, immunizations, and labs). Patients remain on the list until their care gaps are closed. For colorectal cancer screening, MAs mail fecal immunochemistry (FIT) kits to patients or enter orders for those who opt for colonoscopy.

The clinic does not have designated health coaches, but RNs and pharmacists play a health-coaching role for patients with diabetes, hypertension, and heart disease. Residents receive training in motivational interviewing. For the top 5% highest utilizers of care, a specialized RN-led complex-care team intensively manages a panel of about 80 patients.

High-Functioning Primary Care Residency Clinics

Residents learn the EMR-based panel-management tools and have dedicated time for panel management. They coordinate with their MA to do outreach, using phone calls, secure messages, and letters to remind patients to address their care gaps. The clinic's performance for immunizations, Pap smears, mammograms, colorectal cancer screening, and diabetes process measures are at the top of national primary care standards. Each clinician, including residents, can compare their performance on these metrics with the performance of their peers.

Complex-Care Management: University of California, San Francisco Internal Medicine Residency Primary Care Program at San Francisco General Hospital

The teaching clinic has created a complex-care management team for patients who have had three or more hospitalizations in the past year or if their faculty or resident physician feels they are at risk for hospitalization. Common diagnoses are congestive heart failure, chronic obstructive pulmonary disease, diabetes, hypertension, chronic kidney disease, and chronic pain; many patients have four to five diagnoses. Over one-third have substance abuse and/or mental health issues, and 10% are homeless.

The team is led by a full-time RN and a full-time health coach and includes a complex-care medical director and a part-time social worker. A typical caseload for the RN–health coach team is 50 patients. The team meets weekly with the social worker and medical director for case conferences. When a patient is enrolled in the program, the RN and health coach make a home visit, create a care plan, and set goals together with the patient and primary care clinician. Patients with greater levels of need have weekly phone or in-person encounters, mostly with the health coach; the encounters become less frequent as patients improve. The RN works under patient-specific orders and is able to titrate medication doses. The health coach assists patients with behavior change and navigating the health and social services systems. Initial data show a 50% reduction in hospital days after enrollment and a 10% reduction in ED visits.

Complex-Care Management: University of North Carolina Family Medicine Residency

Patients at the Family Medicine Clinic are stratified as low, medium, or high risk based on the numbers of hospitalizations, emergency department visits, diagnoses, and medications. A medical social worker leads a program for the highest-risk patients. Another social worker provides care management for patients with chronic pain. The program targets patients immediately following a hospital admission or emergency department visit. When the team receives electronic alerts on inpatients, someone on the team contacts the patients before they are discharged to ensure follow-up with their primary care physician within five to seven days. The follow-up appointment consists of several mini-visits. The pharmacist performs medication reconciliation, education on changes in the drug regimen, a discussion of barriers to obtaining medications (e.g., cost), and medication adherence. The physician addresses issues related to the hospitalization, and a care manager focuses on social support and referral to community resources.

Building Block 6: Features of Population Management

- Residents have dedicated time to work with team members on panel management for a range of chronic- and preventive-care needs.
- Residents work with health coaches embedded in clinic teams for patients with poorly controlled chronic illnesses.
- Residents work with care managers to support intensive management of complex patients.

CHAPTER 9

Building Block 7: Continuity of Care

Continuity of care is associated with improved preventive and chronic care, higher patient and clinician satisfaction, and lower costs.⁴⁶ It underlies the patient-clinician relationship and is key to the educational value of teaching clinics.^{47,48} From the patient perspective, continuity of care is the percentage of the patient's medical visits that are with the patient's assigned primary care clinician. For example, if a panel of 1,000 patients makes 3,000 visits per year and 2,000 of those visits are to the patients' empaneled clinician and 1,000 visits are to a different clinician, then continuity of care is 67%.

From the resident's perspective, continuity of care is the percentage of the resident's visits that are with patients assigned to the resident's panel. If a resident provides 600 patient visits per year and 500 of these visits are by the resident's patients, the continuity rate is 500/600, or 83%. Continuity of care cannot be measured if the clinic has not accurately empaneled its patients. In our site visits, we heard frequent complaints from residents that they often see other residents' patients. In a 2007 survey of directors of internal medicine teaching clinics, 73% reported that patients see any resident or faculty member when their personal physician is unavailable.²² Two case highlights are provided describing transforming programs for the continuity of care Building Block.

Baystate-Tufts Internal Medicine Residency

The Baystate High Street Health Center's Adult Medicine Clinic has stable teams each made up of 8–10 clinicians—faculty, residents, and an advanced practice clinician (APC). Continuity of care is measured by team, not by clinician. Team continuity—patients seeing one of the team clinicians—was 71% in 2015, up from 64% in 2008. Actual continuity is almost always with one of two clinicians because the scheduling team follows an algorithm that gives appointments to patients with either their empaneled physician or the full-time APC on the team. APCs, who are nurse practitioners and physician assistants, may have small panels of their own patients. However, their main role is to see patients of residents not present in the clinic. Moreover, each team has an RN who knows many of the patients on the team's panel. Team RNs function as the glue holding the team together, serving as continuity figures.

From the physician point of view, data show that during 76% of clinic half-day sessions, faculty members are seeing their own patients. In March 2009, R3 residents reported that they see their own (or possibly one other patient) in 62% of clinic sessions, a significant improvement from 2008 in continuity from the physician perspective. Residents are scheduled using the two-week miniblock system (see Chapter 14), which optimizes residents' regular presence in the clinic. For a significant portion of their residency, residents are seldom absent from the clinic for more than two weeks, making it relatively easy for their patients to see their own resident and for residents to see their own patients.

Group Health Cooperative Family Medicine Residency

At Group Health Cooperative, residents' clinic schedules are designed so that residents are not absent from clinic for more than seven days at a time. Intensive inpatient experiences, during which residents have little to no clinic time, occur in periodic, one-week bursts. Residents are absent from clinic for only

High-Functioning Primary Care Residency Clinics

two four-week blocks during their entire residency, thereby fostering continuity of care. In addition, overall clinic time was recently increased to 30% of total training time, so residents are now in clinic more frequently. Continuity from the resident perspective is 80% for R1s and 60–80% for R2s and R3s. From the patient perspective, continuity of care with a resident is 71%.

If a resident is not in clinic for the day, patients are triaged in the following manner: 1) the resident sees their own patient on a different day (nonurgent), 2) a different resident on the same team sees the patient, 3) a faculty member on the same team sees the patient, 4) a resident on a different team sees the patient, 5) a faculty member on a different team sees the patient, and 6) the patient is seen in the urgent care facility. Options 2–6 are rarely needed.

Building Block 7: Features of Continuity of Care

- Resident schedules minimize length of time spent away from clinic—for example, by using miniblocks.
- Resident panels may be co-empaneled to additional providers to bolster continuity—for example, by using resident practice partners, faculty co-providers, or a team NP or PA.
- Scheduling algorithms prioritize scheduling patients with their primary resident provider or a team continuity provider if the resident is not in clinic.

CHAPTER 10

Building Block 8: Prompt Access to Care

Prompt access to care is of great importance to patients and is a prominent objective for many primary care practices. Though the science of access—often called advanced access—is well-developed,⁴⁹ practices frequently fail in their efforts to reduce patient waiting⁵⁰. Practices are more successful at improving access in a sustainable way when they first measure and control panel size and build capacity-enhancing teams. Access and continuity may be in tension if patients prefer to see any clinician today rather than their own clinician next week. High-performing practices allow patients to decide which takes priority.

Components of prompt access include routine follow-up access, urgent same-day access, night and weekend access, and telephone access. A common access metric is the number of days until the Third Next Available Appointment (TNAA), with the ideal being zero days. Another metric is the percentage of appointment slots that are open over the next week, with a high number indicating that patients can be seen promptly. Several measures—for example, the ability of patients to talk to someone at the clinic without long delays or dropped calls—are available to track phone access.

We observed that some teaching clinics are overwhelmed with patients, and demand for care exceeds the capacity to provide that care. Waits for new and return appointments may approach 60 days. For academic clinics in public hospitals, demand appears to be infinite, and given the hospital's mission, it is difficult to close the clinic to new patients. Two case highlights describe transforming programs for the Access Building Block.

University of Colorado Family Medicine Residency

In early 2015, TNAA was 0–1 day for established patients and 5–10 days for new patients. No-show rates were 5–6%, and the physician bump rate (physicians canceling their clinic) was less than 2%. These metrics are reviewed each month. To sustain these access measures, a clinician is made available for patients wanting same-day appointments. This rotating job is filled by residents, faculty, or midlevel providers. Same-day slots for the morning are opened the afternoon before; slots for the afternoon are opened the same morning. This system prioritizes access over continuity of care. Low no-show rates are achieved by informing adult patients that they may be terminated from the practice after three no-shows in a 12-month period. Patients' clinicians are consulted for termination decisions, and most clinicians allow patients to remain in the practice.

Telephone-access metrics are also collected, and patient complaints about in-person phonecalls are rare. A central call center forwards calls with urgent clinical content to RNs and calls with nonurgent clinical issues to RNs' EMR in-basket. RNs are expected to respond to symptomatic calls within 2 hours and to nonsymptomatic calls within 24 hours. After-hours access to clinicians is available in person through evening clinics three nights a week and by phone to clinicians rotating evening, weekend, and holiday call. Many patients use the electronic patient portal, and residents prefer to contact patients via the portal rather than the telephone.

High-Functioning Primary Care Residency Clinics

University of Rochester Family Medicine Residency

Highland Family Medicine, the residency's primary care practice, has seven teams, each responsible for about 3,500 patients. Each team has four to six part-time residents, three to five part-time faculty, and one almost-full-time nurse practitioner. For the highest-performing teams, the third-next-available appointment is the same day for clinicians seeing patients that day. For those not seeing patients that day, the TNAA is their next day in clinic. Patients can make appointments up to two months in advance, but 67% of the slots are locked, not available for appointments. After one month, half of the 67% locked slots are opened, and the day before, half of the 33% remaining locked slots are available for appointments. The morning of the same day, the final remaining slots become available.

The clinic has added capacity by expanding nonclinician roles on the teams. Nurse care managers offer office consultations and phone outreach to anticipate needs that may not warrant an office visit. With the help of standing orders, MAs order labs that can be done before a patient's office visit so that a second appointment simply to review lab results can be avoided. To address the interaction between access and continuity of care, front-desk personnel say this to patients requesting an appointment: "The next appointment for your physician or nurse practitioner is _____. Do you want that appointment or do you need to see another clinician sooner?"

Building Block 8: Features of Access

- The clinic tracks and achieves prompt access for new-patient, routine follow-up, and urgent same-day appointments, along with night, weekend, and telephone access.
- Same-day access is available with the resident primary provider or a team continuity member if the primary provider is not available, often through advanced-access scheduling (i.e., by reserving some appointments until the week or day prior).
- Having more full-time providers (faculty, NPs, or PAs) on teams helps balance access with continuity for patients when their resident provider is not in clinic.

CHAPTER 11

Building Blocks 7 and 8: Continuity of Care and Prompt Access to Care

Because continuity and access are so important to patients and residents, and because these two goals of primary care clinics closely interact, it is instructive to present a case highlight of a teaching clinic that is transforming its approach to both these Building Blocks.

University of North Carolina Family Medicine Residency

UNC's Family Medicine Clinic has invested significant time and energy to promote and maintain good patient-clinician continuity and access. The patient-perspective continuity measure is the percentage of visits by patients on a physician's panel that are visits to the patient's physician. Average continuity statistics for 2014–2015 are faculty, 65%; R1, 65%; R2, 59%; R3, 59%. The goal is 70% or higher, with some clinicians exceeding 80%. Residents are in clinic with decent regularity; the more often and predictably residents are in clinic, the higher the continuity rate.

The clinic's scheduling system allows patients to make return appointments with their primary care provider (PCP) at any time before the visit date. If an appointment slot remains unfilled, the slot opens several days before the visit date for any patient who does not want to wait for the first available appointment with their own PCP. Front-office staff are trained to offer return appointments with the patient's PCP; if that is unacceptable to the patient, they offer an appointment sooner with someone on the PCP's team.

The time to third-available (TTA) appointment for a nonurgent visit is measured weekly, with a practice-wide goal of <10 days, down from 23 days in 2004. For the 2014–2015 academic year, the average TTA for faculty was 8.3 days; for R1s, 10.1 days; for R2s, 10.6 days; and for R3s, 8.8 days. The TTA is measured for each PCP; a TTA of 10 days means that patients can see their own PCP within 10 days. The TTA for a patient to see any provider on the patient's team is zero days (same-day access).

The access system is designed such that 30% of each PCP's appointment supply is "frozen" (closed to visit scheduling) until three to seven days before the visit date. "Thaw" dates are based on the frequency at which each PCP sees patients; the frozen slots of a first-year resident who sees patients one day a week will thaw seven days in advance; frozen slots of a faculty member with clinics every two to three days will thaw three days in advance. When slots thaw, they are initially reserved for the patients of that PCP. If a slot goes unfilled by the clinic day, other patients can be scheduled in the unused slot. This design maximizes interpersonal continuity while ensuring an adequate supply of return appointments for patients who do not want to wait for the next time their PCP is available. In addition, the average faculty physician has 3.1 clinic sessions per week, and there is a plan to have some faculty in the clinic 6 sessions per week. This trend toward more full-time faculty greatly facilitates continuity and access.

Building Blocks 7 and 8: Features of Continuity and Access

- It is possible to prioritize the continuity-access combination and have reasonable success with both.

CHAPTER 12

Building Block 9: Comprehensiveness and Care Coordination

Comprehensiveness and care coordination encompass both the capacity of a clinic to meet its patients' needs internally and the responsibility of a clinic to arrange for external services—for example, specialists, ancillary and community services, hospital and emergency care, and home care.^{51,52} A survey of 185 internal medicine teaching clinics found that only 18% coordinate patients' care following hospital discharge.²³

In residency teaching practices, care coordination is more complex than in nonteaching practices.²⁷ In addition to coordination with other providers and institutions in the “medical neighborhood,”⁵³ teaching practices require protocols and workflows for internal coordination processes, including follow-up on patient concerns and test results for patients of residents and part-time faculty when the physician is not in clinic^{54,55}. In addition, the transient nature of residency requires careful care transitions between graduating and incoming residents. Incomplete transfer of patient information during care transitions can lead to medical errors, inconsistent care plans, and patients lost to follow-up.^{56–59} Transforming clinics for care coordination are described in three case highlights.

Internal- and External-Care Coordination: Family Medicine Residency of Idaho

Residents are responsible to check their EMR in-boxes every 24 hours. Residents each have an informal partnership with another resident on their team who checks their in-boxes and supports their patients when they are away or on a busy rotation. Team MAs who manage the in-boxes call residents for urgent matters, and a back-up faculty physician is always on call.

FMRI has instituted policies to make sure that patients are carefully transitioned when R3s graduate. In March of their graduating year, R3s scan their patient lists and select the most complex patients for warm handoffs (sometimes including a home visit) to an R2 or R1 of their choice. For complex patients, R3s try to select an R1 who will likely be able to treat these patients for the next two years. Lists of patients not already handed off are transferred to the medical records personnel; they run a list of the last six clinicians who have seen each patient and reassign the patient to the clinician who has seen the patient most often. All patients are alerted that their resident is graduating and that they can choose a new clinician if they wish.

External-care coordination between clinic and hospital is facilitated by having FMRI physicians care for all FMRI patients 24/7. A full-time FMRI RN care manager, based in the hospital, coordinates transitions between hospital, emergency department, and clinic. The RN care manager schedules patients for clinic follow-up with their PCP between 1 and 10 days after discharge, depending on the follow-up urgency. The RN care manager 1) makes sure patients' hospital records are in their FMRI chart, 2) performs medication reconciliation in the hospital, 3) lets clinic clinicians know when their patients are in the hospital, and 4) “closes the loop” to make sure patients understand the details of postdischarge instructions. On discharge day, the RN care manager asks patients such questions

High-Functioning Primary Care Residency Clinics

as, “Is there anything that worries you about your discharge today?” and “You may go home today. How do you feel about that?” She also contacts the patient’s clinician to discuss the discharge plans and makes home visits to certain patients after discharge.

Internal-Care Coordination: Crozer-Keystone Family Medicine Residency

Residents check their EMR in-boxes daily, including labs and test results, even when on nonclinic rotations. R1s are assigned an R2 buddy who helps with their in-boxes. R2s and R3s have an informal buddy system for coverage during vacations and away electives. Faculty preceptors screen all labs and contact patients promptly for seriously abnormal ones.

The panels of graduating residents are usually assigned to R1s. Complex patients are transitioned to R2s, and the last R3 visit may take place together with the patient’s new resident. The front-desk staff person receives a transition face sheet indicating whose patients are being transferred to whom and makes the change in the EMR’s primary care provider field.

Resident Transitions: University of Colorado Family Medicine Residency

The program’s AF Williams Family Medicine Center follows a stepwise approach to ensuring that patients are continuously assigned to a clinician and that this information is communicated when transitions occur.

1. Office manager reviews resident panels and panel sizes.
2. Graduating R3s are given a list of all patients on their panel.
3. R3s review the panel and determine an ideal physician for each patient, particularly complex ones. The ideal physician may be a resident or faculty physician.
4. R3s prepare a “sign-out” in patient charts, communicate the handoff to the new physician, and, if possible, schedule a shared visit with both physicians.
5. Patients not handed off to a specific new physician are reassigned by the office manager.
6. Reassignment starts with filling the panels of residents or faculty who will be at the clinic the longest to encourage longitudinal continuity of care.
7. The clinic sends all patients a letter with their new physician’s name, and the physician fields are changed in the EMR so that the new physician receives all future results and communications.
8. Population data are also factored into the reassignment so that new R1 panels have an appropriate complexity balance.

Building Block 9: Features of Comprehensiveness and Care Coordination

- When residents are away or on busy rotations, reliable systems exist for coverage of EMR in-boxes and urgent patient issues by team staff, resident practice partners, or faculty.
- Clear protocols exist for transitioning patients to new providers when residents graduate so patients are not lost in transition and complex patients are handed off effectively.
- Team members provide external-care coordination for specialty referrals and transitions after hospitalizations and ED visits.

CHAPTER 13

Building Block 10: Template of the Future

Template of the future refers to a daily schedule that offers patients alternatives to the one-on-one, in-person clinician office visit.⁶⁰ These alternatives include e-visits through a patient portal, telephone and video-based encounters, group visits (also called shared medical appointments), and visits with nonclinician team members. In this advanced scheduling template, the clinician role is redefined such that the clinician no longer sees all patients in 15-minute slots but acts as a team leader and has protected time for e-visits and telephone visits. Full implementation of this scheduling template requires payment reform that reimburses patient encounters outside the traditional clinician-patient visit. While such payment reform is beginning to take hold, its rarity explains why few primary care organizations have achieved full implementation of this scheduling template.

Most clinics we visited use time-fixed visit slots for patient care, often 15- or 20-minute visits for acute or follow-up care and sometimes longer visits for complex care, physical exams, well-child care, and procedures. Alternative encounter types are not available to patients. We observed a few clinics that adapt resident schedules to facilitate novel approaches to serving patients. The following case highlights describe two clinics that are moving toward the template of the future.

University of Rochester Pediatric Residency

This program has found that integrating telemedicine into the medical home is a patient-centered way to serve urban, underserved patients. The model meets acute and follow-up-care needs of patients in daycare or at school, dramatically reducing missed days by children and missed work for parents. Video-based visits enable family-centered care, addressing the sometimes complex mix of individuals serving the chronically ill child. The program has shown a 22% decrease in emergency department visits for children with access to telemedicine during the day, demonstrating the value of offering primary care services when and where they best meet families' needs.

Often, a Rochester pediatric clinic staff member travels to schools, homes, and daycares with a portable telemedicine unit to facilitate video-based visits. This staff member helps bring the patient to a private location for the visit and may conduct relevant physical evaluation (e.g., vital signs, otoscopic exam, high-definition skin exam, and stethoscope audiofiles) by protocol and/or at the direction of the provider. Rapid strep and culture swabs can be done on site and brought back to the lab. Both faculty and residents have telemedicine appointments built into their schedules, which can be same-day add-on appointments or prearranged follow-ups. On average, each resident does four to five telemedicine visits per year. Residents are trained to view telemedicine visits as another option in meeting patients' needs.

Group Health Cooperative Family Medicine Residency

As an integrated delivery system providing capitated care, Group Health has a global budget and is not dependent on fee-for-service, visit-based reimbursement. R3s and faculty are expected to see eight patients in a half-day clinic session plus have two phone visits. R2s see seven patients per session and have two phone visits, while R1s see four to six patients and have two phone visits. Fifty percent of

High-Functioning Primary Care Residency Clinics

patient encounters are conducted through phone or e-visits via the patient portal. Faculty and resident clinic schedules have reserve time for “desktop medicine,” which includes managing secure messages, studying results, and making scheduled phone visits. Warm handoffs frequently occur between residents and behavioral health specialists. Additionally, residents schedule shared visits with an RN for more-complex patients.

Residents are taught how to conduct phone visits and e-visits through a standard curriculum and use these visit types with their patients. Preceptors evaluate these encounters and give feedback. Residents receive training at the beginning of residency about RN, pharmacist, and behavioral health roles and receive real-time feedback after shared visits. Face-to-face visits still dominate the daily schedule, and sometimes the protected time for e-encounters and phone visits is consumed as catch-up time. Nevertheless, residents are well prepared to enter a new world in which face-to-face clinician visits are no longer the dominant model for primary care.

Building Block 10: Features of the Template of the Future

- Resident templates include telephone and e-visits, and residents communicate with patients through an electronic portal.
- Residents participate in group visits and partner with their team for RN, pharmacist, and behavioral health visits.
- Requires payment reform to be sustainable.

CHAPTER 14

Resident Building Block 1: Resident Scheduling

How residents' time is scheduled determines how well a teaching clinic can implement the Building Blocks of high-performing primary care. A 2007 survey found that the majority of internal medicine teaching clinics subordinate the creation of clinic schedules to the needs of inpatient and specialty rotations.²² Eric Warm writes that residents see ambulatory patients in the spaces between inpatient ward work and that the main goal of the clinic is to finish up and get back to the wards. "For most residents, forming continuous healing relationships in this setting is a fantasy."⁶¹ Residents are typically not available to their patients between their half-day clinic sessions.⁶² Conflict between inpatient and outpatient responsibilities is associated with an inability to focus on the clinic, causing low resident and patient satisfaction and frustration for clinic staff.⁹ In one internal medicine program, only 16% of residents felt that the program minimized conflict between inpatient and outpatient responsibilities; when these responsibilities were separated so residents do not work in the hospital and in the clinic on the same day, 98% of residents agreed that the conflict was minimized.⁶³

Resident scheduling in transforming programs follows several general principles:

1. Schedules are made far in advance so that clinics can plan their work.
2. Inpatient services do not control resident schedules; schedules are worked out collaboratively between clinic and hospital, with the clinic's needs taken seriously.
3. Resident presence in the clinic is predictable so that teams can function smoothly.
4. The tension experienced by residents between inpatient and outpatient duties is reduced or eliminated.

Clinics attempting to implement these principles follow one of two broad resident-scheduling models: 1) the traditional weekly clinic experience, whereby residents see their outpatients one or two half-days per week during most of their rotations, and 2) the block model, in which residents engage in sustained clinic time for several sessions per week, alternating with sustained time away from the clinic.⁹ In addition, some programs have increased total resident time in the clinic; this increase varies between family medicine residencies that train only primary care physicians and residencies in internal medicine or pediatrics that train both primary care and specialist physicians.

Block models include the 12-month "long block," in which residents spend 12 consecutive ambulatory care months (see University of Cincinnati case highlight in this chapter)⁶¹ and the X+Y block models, in which residents alternate between X weeks of inpatient or elective rotations without clinic sessions and Y weeks of focused clinic work. The most common X+Y models are 3+1, 4+1, and 6+2, which involve three to six weeks of inpatient rotations alternating with one to two weeks of outpatient primary care clinic blocks.⁴⁷ In contrast, the 1+1 model of Group Health (see Group Health case highlight below) and the 2+2 model (see Baystate-Tufts case highlight) involve shorter durations of time away from clinic. During the weeks when the resident is not in clinic, other residents, faculty, nurses, and medical assistants address the resident's patients' needs. In preliminary studies, resident satisfaction with the X+Y model is greater than in the traditional model,⁶⁴ but continuity of care for patients is variable^{47,65}. Programs with shorter intervals of residents away from clinic (i.e., 1+1 and 2+2) and more time spent in

High-Functioning Primary Care Residency Clinics

clinic overall (i.e., 30% of residency) tend to have improved continuity of care for patients. Overall, any scheduling model has the drawback that the resident is away from clinic part of the time and does not experience the full weight of responsibility for a panel of patients.

Because resident scheduling is fundamental to transforming resident teaching clinics, four case highlights are presented.

Two-Week Miniblocks: Baystate-Tufts Internal Medicine Residency

A few years ago, according to interviews with staff at the Baystate High Street Health Center's Adult Medicine Clinic, the clinic was "awful." Schedules dictated that residents work all night in the hospital and come to the clinic for 8 a.m. appointments, arriving late and tired. Preceptors spent little time in clinic, and waits for appointments could approach three months. The clinic has changed dramatically since that time.

Baystate-Tufts implemented the two-week miniblock for second-year residents in 2008 and for all residents in 2015. Month-long blocks are divided into two-week inpatient and two-week ambulatory miniblocks. During inpatient weeks, residents do not attend clinic, and during ambulatory weeks, they are not in the hospital. The two-week miniblock system was instituted for two reasons: 1) reducing residents' tension when leaving the inpatient service midday and rushing to see clinic patients and 2) allowing residents to be in clinic for two out of four weeks in a month, which increases continuity of care for patients.

In addition to the positive influence of the miniblock system, the clinic has created a small core faculty that is in clinic most of the time, either seeing their own patients or precepting residents. Faculty generally have six clinical sessions, two precepting sessions, and two administrative half-days. A small core of faculty engaged in clinic improvement—in contrast to many very-part-time faculty physicians for whom the clinic is not a priority—has been transformational for patient continuity, resident teaching, stable teams, and overall clinic functioning.

Resident schedules are carefully designed so that residents remain on the same care team for their entire three years. They become comfortable working with the same RN and MA on their team and rely on the RN to attend to their patients' concerns when they are not in clinic. Keeping residents on their home team is a priority.

The residency and clinic schedulers work closely together. Each year, the Baystate Department of Medicine provides the clinic scheduler with a block schedule for all resident rotations, including vacation time. The clinic scheduler enters into the scheduling system the times the residents will be in clinic and makes sure that the residents work on their home team and are present on each team's "team day." The expertise and caring of the schedulers is central to the success of the program.

One-Week Blocks: Group Health Cooperative Family Medicine Residency

Residents have approximately the same amount of inpatient time all three years and are not absent from clinic for more than seven days at a time except for two four-week blocks during their entire

High-Functioning Primary Care Residency Clinics

residency. R1s and R2s have inpatient medicine in one-week blocks during which they have no outpatient duties, and R3s have two-week inpatient blocks with one clinic session during that time.

R1s spend more time in clinic relative to R2s and R3s, giving them intensive training in primary care medicine at the beginning of residency. Overall clinic time in the Group Health residency was increased to 30% of total training time, in contrast to the average 10–15% of most residency programs. Continuity of care is promoted by having residents in clinic more frequently and by not allowing long gaps between resident clinic sessions. Continuity from the resident perspective is 80% for R1s and 60–80% for R2s and R3s. From the patient perspective, continuity of care with the patient's resident PCP is 71%.

The Long Block: University of Cincinnati Internal Medicine Residency

Residents starting the program have a traditional schedule for their first 16 months, with two to four half-day primary care clinic sessions per month. From months 17 to 29, residents fully dedicate themselves to the clinic, serving as the primary care physician for their patient panel. During this “long block,” residents have three half-days of clinic per week, with specialty and consult responsibilities at other times. However, long-block residents are expected to be present in clinic at some time each day of the week to check their in-boxes, communicate with their team RN, and coordinate care for their patients. Clinic staff can reach long-block residents, who are actively engaged with their patients even when not formally in clinic.

The clinic controls residents' schedules for these months, choosing which half-days they are in clinic, thereby allowing consistency with their team members. Long-block residents come together for weekly, clinic-wide interdisciplinary team meetings and weekly didactic sessions. When long block ends, most residents leave the clinic entirely and transfer their entire patient panel to an incoming long-block resident on their team. The long-block model does not increase total clinic time for residents but focuses that time during 12 months.

Teams consist of four to five residents working in a minipractice with a dedicated RN. R1 panel size is 15 patients, R2s pre-long block have 30 patients, and long-block residents care for 150 patients. Long-block residents get to know their panels well and can follow patients through acute crises when needed. For example, if a patient suffers a heart-failure exacerbation and needs weekly visits, or if a patient is newly diagnosed with metastatic cancer and needs multiple visits, coordination with specialists, and perhaps hospice referral, residents fit these patients into their schedule as frequently as needed. The aim of long-block scheduling is to give residents an authentic 12-month experience of primary care. The long block has been associated with enhanced resident and patient satisfaction and improved preventive care and continuity of care.^{61,62}

Increased Clinic Time: Tufts-Cambridge Health Alliance Family Medicine Residency

The Tufts family medicine residency at the Cambridge Health Alliance's Malden teaching site includes 24 residents, 8 each year. The program has adopted a clinic first philosophy: R2s spend 22 weeks and R3s, 30 weeks in the family medicine center rotation, with about six primary care half-day sessions per week. R2s spend 46% and R3, 63% of total residency time in the clinic. The clinic is viewed as the teacher.

High-Functioning Primary Care Residency Clinics

A critical part of a new scheduling paradigm is that a small core faculty is dedicated to the clinic, working six patient care sessions plus one attending session per week. The clinic leadership, not the faculty, decides who works which sessions. If faculty wish to change a scheduled day, they must fill out a form 90 days in advance, which must be approved by top leadership. Even the clinic medical director has been denied a time-off request because she was needed. The needs of the clinic are greater than the needs of each individual physician.

Tufts-Cambridge Health Alliance has elevated scheduling to a science, perfected by the Malden clinic practice manager working closely—on a daily basis—with the residency operations manager. Scheduling rules are made together and religiously followed. A 6-page scheduling template for faculty and residents and a 13-page “Scheduling Bible” detail the rules that the schedulers follow.

Scheduling begins with an overall agreement between the clinic, hospitals, and specialty services on how many weeks R1s, R2s, and R3s will spend on each rotation (Malden clinic, inpatient adult medicine, ICU, OB, inpatient pediatrics, surgery, psychiatry, gynecology, and vacation) and how many clinic sessions R1s, R2s, and R3s have during each rotation. Inpatient rotations do not trump clinic time.

This basic agreement is then filled in with a yearly schedule for each of the 24 residents, showing which rotation each resident will be on during which month for an entire year and—another layer of detail—where the resident will be each morning, afternoon, and evening of each day. In addition, a schedule is created mandating what each faculty physician will be doing each morning, afternoon, and evening of each day. The schedulers prioritize having faculty and residents always working on their team, with faculty and residents paired as often as possible with the same MA. A monthly preceptor planning schedule establishes which preceptors will be teaching on which days and ensures that a sufficient number of preceptors are available. In the past, there would be 14 residents in clinic some days and none other days. Now, a scheduling goal is to have almost the same number of residents in clinic every day.

The importance of scheduling is underlined by the fact that the practice manager, one of the clinic’s top leaders, spends a considerable portion of her time on scheduling. Canceling patients who have appointments is not allowed except in dire emergencies. If for some reason physicians need to cancel patients, the physicians are expected to call the patients themselves.

Resident Building Block 1: Features of Resident Scheduling

- For programs with a clinic first orientation, resident schedules give priority to clinic rather than to the traditional priority, inpatient needs.
- Residents are scheduled in clinic regularly, predictably, and far in advance, with short intervals between clinic time, in order to maintain stable teams and provide patient continuity.
- Block scheduling eliminates the tension between simultaneous inpatient and outpatient duties.
- Clinic first scheduling maximizes resident time in clinic over the course of residency training.
- Clinic first programs have created a small core of faculty physicians who are in clinic the majority of the time.

CHAPTER 15

Resident Building Block 2: Resident Engagement

This second resident Building Block does not address the clinical education of residents but focuses on the training of residents to become leaders in primary care transformation. We observed that if teaching clinics have not implemented the other Building Blocks, residents are unable to experience, and thus to master, the characteristics of high-performing primary care. Transforming programs have implemented many of the Building Blocks, allowing residents to become primary care leaders through their participation in excellent primary care.

Crozer-Keystone Family Medicine Residency

Practice-transformation education is provided through hands-on experience —“the clinic is the curriculum.” All residents are involved in redesigning the clinic, with a few R2s and R3s per year showing a special interest in primary care improvement. Residents work on longitudinal quality-improvement projects in multidisciplinary teams.

The residency curriculum includes an introductory course for R1s on medical home concepts; R2s have more in-depth didactic sessions on core procedures, evidence-based medicine, practice management (e.g., legal issues, billing coding, and leadership), quality improvement, and dashboard data management. R2s shadow the front desk to learn the scheduling process. R3s spend four weeks in a clinic “mastery” curriculum, working with the clinic practice manager to learn leadership development. R2 and R3 residents perform a “teaching resident” role, learning how to function as an attending—managing clinic flow, screening labs, addressing acute phone calls, and juggling patient schedules.

McGaw Northwestern Family Medicine Residency Program at Erie Humboldt Park Health Center

The program’s homegrown curriculum focuses on team-based care, patient-centered medical home (PCMH), accountable-care organizations, shared decision making, quality improvement (including plan-do-study-act, or PDSA, cycles), communication and conflict resolution, and implementing clinic systems. The faculty has designed the curriculum such that didactic sessions are paired with hands-on, skills-based work. For example, didactics on PDSA cycles are accompanied by actually doing PDSAs with the residents’ teams.

To model collaborative team learning, instruction is delivered not only by faculty but also by nurses, MAs, and behavioral health professionals. For example, RNs teach residents about spirometry, MAs teach about clinic flow, and behavioral health professionals provide sessions on crisis management. MAs and RNs are encouraged to give feedback to residents and evaluate residents twice each year. Staff participate in morbidity and mortality case conferences, which dramatically changes the discussion from a focus on pathophysiology to an analysis of system failures, social determinants of health, and care coordination. Residents interested in policy may accompany clinic leaders to local and national meetings with policy makers, and several residents of the program have testified at legislative hearings.

Resident Building Block 2: Features of Resident Engagement

- Residents are engaged in sustainable clinic-improvement projects by working as leaders of multidisciplinary teams.
- Education in quality improvement, patient-centered medical home, and practice-transformation leadership goes beyond didactics by providing hands-on experience.
- Training residents to be leaders in primary care requires experience working and serving as a leader in a well-functioning clinic.

CHAPTER 16

Resident Building Block 3: Resident Worklife

How residents and medical students feel about the time they spend in primary care teaching clinics is a key factor influencing the future of the primary care physician workforce. If faculty, learners, and staff are dissatisfied and stressed and if the teaching clinic works poorly for patients, the take-home message becomes this: avoid primary care careers if you can. Forty-three percent of first-year and 25% of third-year internal medicine residents report significant stress caring for patients in their teaching clinic.²² A national study reported burnout in 51.5% of internal medicine residents and dissatisfaction with work-life balance in 32.9%.⁶⁶ A 2015 meta-analysis concluded that an estimated 27% of U.S. resident physicians report depression or depressive symptoms.⁶⁷ We were disturbed to find that in some teaching clinics, residents dreaded their clinic day.

A key facilitator of resident well-being is the excellence of clinic functioning—in particular, the teams within which residents experience the clinic. In contrast with residents scheduled to work on different teams and with different MAs on different days, residents always working on their home team affirm that “the most enjoyable part of the day is how well the team works together.” Transforming clinics for resident work-life balance are described in three case highlights.

Family Medicine Residency of Idaho

Camaraderie among the residents at FMRI is evident. Residents develop stress-reducing coverage systems and “want to see each other find their niche and succeed.”

Each resident class has a retreat to process their residency experience. Once a year, R1s discuss three categories: Roses, Thorns, and Buds. Roses are positive attributes; for example, “The R1 class is friendly and cohesive . . . which becomes apparent when you see good attendance at socials, people hanging out outside of work, and significant others spending time with each other.” Thorns are areas that could be improved. In 2014, FMRI leadership addressed two Thorns right away. For one Thorn, “the desktop is stressful and almost seems unnecessarily so,” a plan was made to standardize and improve workflow. Buds are activities that residents look forward to—for example, “Excited to have more outpatient blocks and trying to find more balance in life” and “Looking forward to learning how to be a better clinic physician and become more efficient, including note completion!”

To build team cohesion, team members are challenged to take breaks and walk for 20 minutes throughout the workday. Once completed, team members put a colored sticker next to their name for that day. Even the program’s president and CEO participates in this walking challenge. Staff members report that FMRI “feels like a family” and that “everyone here feels empowered and important.”

Tufts-Cambridge Health Alliance Family Medicine Residency

Compared with traditional teaching clinics, residents are in clinic more often, are assigned to one team for their three years, and almost always work on their home team. A small core of faculty preceptors spend most of their professional life in the clinic and care deeply about the clinic and the residents they precept. Residents rarely have inpatient and clinic responsibilities on the same day,

High-Functioning Primary Care Residency Clinics

which reduces stress. Residents initiate clinic improvements and feel like full participants rather than occasional guests in the clinic.

“How’s It Going?” is a monthly measure of staff, faculty, and resident satisfaction, asking about their level of agreement with the following statements:

- Leadership creates an environment where things can be accomplished.
- I am treated with respect every day by everyone in this practice.
- I am given everything I need—tools, equipment, and encouragement—to make my work meaningful to my life.
- When I do good work, someone in this practice notices that I did it.
- This practice is a better place to work than it was 12 months ago.
- I would recommend this practice as a great place to work.

Responses score in the 60–90% range, with 100% being the most satisfied. The program is working to increase resident participation and to address areas with lower scores. The residency is popular; in October 2014, 780 medical students were considering the program as their residency choice. (There are eight first-year-resident slots.)

University of Cincinnati Internal Medicine Residency

Residents are enthusiastic about the long-block system that provides a year of total clinic immersion. One resident said, “Residents get an authentic 12-month primary care experience that no other model does. You are the physician for patients continuously for 12 months.” Another resident agreed that the long-block experience was a great one, “better for training and better for continuity.” Another resident shared her appreciation for dedicated time in clinic. “It’s very difficult to focus on outpatient care when on the wards. Long block was a reprieve—and it was really nice to focus on outpatient. I felt like I could be a real primary care doc and prepare for the real world. It’s amazing how comfortable you get managing a panel independently after a year.” Residents commented that the clinic flows smoothly, they could get through a clinic day with a manageable workload, and they were not staying late into the night finishing notes, addressing in-box messages, and coordinating care for their panels.

Resident Building Block 3: Features of Resident Worklife

- Resident experience and burnout is effectively assessed, and a structure exists to respond actively to resident feedback.
- Leadership promotes an open and empowering culture for residents and clinic teams.
- Logistically separating outpatient and inpatient responsibilities allows residents to focus on outpatient training.
- Well-functioning clinics create positive clinic experiences for residents and, thus, positive attitudes toward primary care careers.

CHAPTER 17

Conclusion

Our study team made site visits to 23 geographically dispersed family medicine, internal medicine, and pediatric residency programs and their associated primary care clinics. Using a detailed site-visit guide, we met with leaders, faculty, residents, and staff, and we shadowed clinicians and staff to observe how the clinics function. We found a number of clinics that are transforming themselves into organizations optimizing both their education and patient care missions, creating a satisfying environment for patients, faculty, residents, and staff. The transformation embraced such primary care attributes as empanelment, population-based care, continuity, access, and team-based care. The 10 + 3 Building Blocks of Resident Teaching Clinics indicate the features of teaching clinics in transformation (Figure 2).

Several programs had taken six actions to accomplish this transformation:

1. Design resident schedules that prioritize continuity of care and eliminate tension between inpatient and outpatient duties.
2. Develop a small core of clinic faculty.
3. Create operationally excellent practices.
4. Build stable clinic teams that give residents, staff, and patients a sense of belonging.
5. Increase resident time spent in primary care clinic to enhance ambulatory learning and patient access.
6. Engage residents as co-leaders of practice transformation.

Though the challenges facing teaching clinics are formidable, this report demonstrates that residency programs can successfully undertake this transformation journey—a recognition that has inspired our study team. To improve patient care, enhance resident teaching, and attract medical students and residents to primary care careers will require that many more training programs pay close attention to the 10 + 3 Building Blocks.

References

1. National Center for Health Statistics. Health United States 2013. Hyattsville, MD: NCHS, 2014.
2. Meltzer DO. Hospitalists and primary care. *J Gen Intern Med* 2015;30:L541-542.
3. Rogers EM. Diffusion of Innovations. 5th edition. New York, NY: The Free Press, 2003.
4. Bodenheimer T, Pham HH. Primary care: current problems and proposed solutions. *Health Affairs* 2010;29(5):799-805.
5. Keirns CC, Bosk CL. Perspective: the unintended consequences of training residents in dysfunctional outpatient settings. *Acad Med* 2008;83:498-502.
6. Phillips RA, Bitton A. Tectonic shifts are needed in graduate medical education to ensure today's trainees are prepared to practice as tomorrow's physicians. *Acad Med* 2014;89:1444-1445.
7. Faherty LJ, Mate KS, Moses JM. Leveraging trainees to improve quality and safety at the point of care: three models for engagement. *Acad Med* 2015, Nov. 2 epub.
8. Warm EJ, Leasure E. Primary care and primary care training: mirror images. *J Gen Intern Med* 2010;26:5-7.
9. Wieland JL, Halvorsen AJ, Chaudhry R, Reed DA, McDonald FS, Thomas KG. An evaluation of internal medicine residency continuity clinic redesign to a 50/50 outpatient–inpatient model. *J Gen Intern Med* 2012;28:1014-1019.
10. Bowen JL, Salerno SM, Chamberlain JK, et al. Changing habits of practice. Transforming internal medicine residency education in ambulatory settings. *J Gen Intern Med* 2005;20:1181-1187.
11. Salerno SM, Faestel PM, Mulligan T, Rosenblum MJ. Disruptions and satisfaction in internal medicine resident continuity clinic differ between inpatient and outpatient rotations. *Teach Learn Med* 2007;19:30-34.
12. Francis MD, Thomas K, Langan M, et al. Clinic design, key practice metrics, and resident satisfaction in internal medicine continuity clinics. *J Grad Med Educ* 2014;6:249-255.
13. Dupras DM, West CP. Training for careers in primary care: time for attention to culture. *J Gen Intern Med* 2015;30:1243-1244.
14. Peccoralo LA, Tackett S, Ward L, et al. Resident satisfaction with continuity clinic and career choice in general internal medicine. *J Gen Intern Med* 2012;28:1020-1027.

High-Functioning Primary Care Residency Clinics

15. Shapiro M, Fornari A. Factors influencing primary care residency selection among students at an urban private medical school. *Einstein J Biol Med* 2009/2010;25/26:19-24.
16. Weber EJ. Practicing what we teach: in order to teach patient-centered care, we need to deliver it. *Acad Med* 2015;90:14-15.
17. Association of American Medical Colleges. *Moving the Medical Home Forward*. Washington, DC: AAMC, November 2010.
18. Bitton A, Sugarman J, Mann Z, et al. Primary care transformation in academic medical homes. Institute for Healthcare Improvement National Forum, December 8, 2013.
19. Willard R, Bodenheimer T. *The Building Blocks of High-Performing Primary Care: Lessons from the Field*. Oakland, CA: California HealthCare Foundation, 2012.
20. Bodenheimer T, Ghorob A, Willard-Grace R, Grumbach K. The 10 Building Blocks of high-performing primary care. *Ann Fam Med* 2014;12:166-171.
21. Gupta R, Arora VM. Merging the health system and education silos to better educate future physicians. *JAMA* 2015;314:2349-2350.
22. Nadkarni M, Reddy S, Bates CK, Fosburgh B, Babbott S, Holmboe E. Ambulatory-based education in internal medicine: current organization and implications for transformation. Results of a national survey of resident continuity clinic directors. *J Gen Intern Med* 2010;26:16-20.
23. Babbott SF, Beasley BW, Reddy S, Duffy FD, Nadkarni M, Holmboe E. Ambulatory office organization for internal medicine resident medical education. *Acad Med* 2010;85:1880-1887.
24. Langley GJ, Moen R, Nolan KM, et al. *The Improvement Guide: A Practical Approach to Enhancing Organizational Performance*. San Francisco, CA: Jossey-Bass, 2009.
25. Empanelment: Establishing Patient-Provider Relationships. Safety Net Medical Home Initiative, May 2013. [www.safetynetmedicalhome.org/change-concepts/empanelment guide](http://www.safetynetmedicalhome.org/change-concepts/empanelment-guide). Accessed Aug. 14, 2016.
26. Murray M, Davies M, Boushon B. Panel Size: How Many Patients Can One Doctor Manage? *Fam Pract Manag* 2007;14(4):44-51.
27. Greater New York Hospital Association. *Redesigning the Teaching Clinic: a Toolkit for Improving Care Coordination and Resident Learning*. October 2012. www.gnyha.org. Accessed Aug. 14, 2016.
28. Yarnall KS, Ostbye T, Krause KM, Pollak KI, Gradison M, Michener L. Family physicians as team leaders: "time" to share the care. *Prev Chronic Dis* 2009;6:1-6.

High-Functioning Primary Care Residency Clinics

29. Shanafelt TD, Boone S, Tan L, Dyrbye LN, Sotile W, Satele D, et al. Burnout and satisfaction with work-life balance among US physicians relative to the general US population. *Arch Intern Med* 2012;172:1377-1385.
30. Bodenheimer T, Smith MD. Primary care: proposed solutions to the physician shortage without training more physicians. *Health Affairs* 2013;32:1881-1886.
31. Willard-Grace R, Hessler D, Rogers E, Dube K, Bodenheimer T, Grumbach K. Team structure and culture are associated with lower burnout in primary care. *J Am Board Fam Med* 2014;27:229-238.
32. Bodenheimer T, Willard-Grace R, Ghorob A. Expanding the roles of medical assistants. Who does what in primary care? *JAMA Intern Med* 2014;174:1025-1026.
33. Ghorob A, Bodenheimer T. Sharing the care to improve access to primary care. *N Engl J Med* 2012;366:1955-1957.
34. Ghorob A, Bodenheimer T. Building teams in primary care: a practical guide. *Fam Syst Health* 2015;33:182-192.
35. Bodenheimer T, Laing BY. The teamlet model of primary care. *Ann Fam Med* 2007;5:457-461.
36. Gupta R, Davis E, Horton C. Interval examination: building primary care teams in an urban academic teaching clinic. *J Gen Intern Med* 2013;28:1517-1521.
37. Anderson P, Halley MD. A new approach to making your doctor-nurse team more productive. *Fam Pract Manag* July/August 2008:35-40.
38. Patel MS, Arron MJ, Sinsky TA, Green EH, Baker DW, Bowen JL, Day S. Estimating the staffing infrastructure for a patient-centered medical home. *Am J Manag Care*. 2013;19:509-516.
39. Blash L, Dower C, Chapman S. University of Utah Community Clinics: medical assistant teams enhance patient-centered, physician-efficient care. <http://www.futurehealth.ucsf.edu/Content>. Accessed April 7, 2015.
40. Shunk R, Dulay M, Chou CL, Janson S, O'Brien BC. Huddle-coaching: a dynamic intervention for trainees and staff to support team-based care. *Acad Med* 2014;89:244-250.
41. Chen EH, Bodenheimer T. Improving population health through team-based panel management. *Arch Intern Med*. 2011;171:1558-1559.
42. Ghorob A. Health coaching. Teaching patients to fish. *Fam Pract Manag* 2013; 20(3):40-42.

High-Functioning Primary Care Residency Clinics

43. Thom DH, Ghorob A, Hessler D, De Vore D, Chen E, Bodenheimer T. Impact of peer health coaching on glycemic control in low-income patients with diabetes: a randomized controlled trial. *Ann Fam Med* 2013;11:137-144.
44. Willard-Grace R, Chen EH, Hessler D, et al. Health coaching by medical assistants to improve control of diabetes, hypertension, and hyperlipidemia in low-income patients: a randomized controlled trial. *Ann Fam Med* 2015;13:130-138.
45. Bodenheimer T, Berry-Millett R. *Care Management for Patients with Complex Healthcare Needs*. Princeton, NJ: Robert Wood Johnson Foundation, 2009.
46. Saultz JW, Lochner J. Interpersonal continuity of care and care outcomes: a critical review. *Ann Fam Med* 2005;3:159-166.
47. Heist K, Guese M, Nikels M, Swigris R, Chacko K. Impact of 4+1 block scheduling on patient care continuity in resident clinic. *J Gen Intern Med* 2014;29:1195-1199.
48. Gupta R, Bodenheimer T. How primary care practices can improve continuity of care. *JAMA Intern Med* 2013;173:1885-1886.
49. Murray M, Tantau C. Same-day appointments: exploding the access paradigm. *Fam Pract Manag* 2000;7(8):45-50.
50. Mehrotra A, Keehl-Markowitz L, Ayanian JZ. Implementing open-access scheduling of visits in primary care practices: a cautionary tale. *Ann Intern Med* 2008;148:915-922.
51. Olayiwola JN, Bodenheimer T, Dube K, Willard-Grace R, Grumbach K. *Facilitating Care Integration in Community Health Centers*. San Francisco, CA: UCSF Center for Excellence in Primary Care, March 2014. www.blueshieldcafoundation.org/sites/default/files/publications/downloadable/Facilitating_Care_Integration_Mar_2014.pdf
52. Bodenheimer T. Coordinating care—a perilous journey through the health care system. *N Engl J Med* 2008;358:1064-1071.
53. Fisher ES. Building a medical neighborhood for the medical home. *N Engl J Med* 2008;359:1202-1205.
54. Gakhar B, Spencer AL. Using direct observation, formal evaluation, and an interactive curriculum to improve the sign-out practices of internal medicine interns. *Acad Med* 2010;85:1182-1188.
55. Torre DM, Reed DA. Optimizing handoff training and outcomes in medical education. *J Gen Intern Med* 2013;28:980-981.

High-Functioning Primary Care Residency Clinics

56. Moore C, Wisnivesky J, Williams S, McGinn T. Medical errors related to discontinuity of care from an inpatient to an outpatient setting. *J Gen Intern Med* 2003;18:646-651.
57. Pincavage AT, Ratner S, Prochaska ML, Prochaska M, Oyler J, Davis AM, Arora VM. Outcomes for resident-identified high-risk patients and resident perspectives of year-end continuity clinic handoffs. *J Gen Intern Med* 2012;27(11):1438-1444.
58. Caines LC, Brockmeyer DM, Tess AV, Kim H, Kriegel G, Bates CK. The revolving door of resident continuity practice: identifying gaps in transitions of care. *J Gen Intern Med* 2011;26:995-998.
59. Bump GM. Residents' final transition: the graduation clinic hand-off. *J Gen Intern Med* 2014;30:45-46.
60. Margolius D, Bodenheimer T. Transforming primary care: from past practice to the practice of the future. *Health Affairs* 2010;29:779-784.
61. Warm EJ. Interval examination: the ambulatory long block. *J Gen Intern Med* 2010;25:750-752.
62. Warm EJ, Schauer DP, Diers T, Mathis BR, Neirouz Y, Boex JR, Rouan GW. The ambulatory long-block: an Accreditation Council for Graduate Medical Education (ACGME) Educational Innovations Project (EIP). *J Gen Intern Med* 2008;23:921-926.
63. Bates CK, Yang J, Huang G, et al. Separating residents' inpatient and outpatient responsibilities. *Acad Med* 2015; Aug. 4 epub.
64. Chaudhry SI, Balwan S, Friedman KA, Sunday S, Chaudhry B, DiMisa D, Fornari A. Moving forward in GME reform: a 4 + 1 model of resident ambulatory training. *J Gen Intern Med* 2013;28:1100-1104.
65. Thomas KG, West CP, Popkave C, Bellini LM, Weinberger SE, Kolars JC, Kogan JR. Alternative approaches to ambulatory training: internal medicine residents' and program directors' perspectives. *J Gen Intern Med* 2009;24:904-910.
66. West CP, Shanafelt TD, Kolars JC. Quality of life, burnout, educational debt, and medical knowledge among internal medicine residents. *JAMA* 2011;306:952-960.
67. Mata DA, Ramos MA, Bansal N, et al. Prevalence of depression and depressive symptoms among resident physicians. *JAMA* 2015;314:2373-2383.



**Association of
American Medical Colleges**

655 K Street, N.W., Suite 100, Washington, D.C. 20001-2399
T 202 828 0400
www.aamc.org