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

UCSF Center for Excellence in Primary Care

Facilitating care integration in Community Health Centers:

A conceptual framework and literature review on best practices for integration into the medical neighborhood

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Executive summary

Background

The four pillars of primary care practice articulated by Dr. Barbara Starfield -- first contact care, continuity of care, comprehensive care, and coordination of care - are the foundation for all future elaborations of high-performing primary care. Care integration between the medical home and its surrounding medical neighborhood is increasingly complex. The typical primary care clinician interacts with as many as 229 other providers in 117 different practices and the probability that a clinician visit will result in a referral to another clinician almost doubled from 1999 to 2009. Forty-two percent of adults with health problems report problems with the coordination of their care.

Community Health Centers (CHCs) and other safety net primary care practices have long served as the bedrock of comprehensive, high quality, and cost-effective health care for underserved and disenfranchised populations in California and across the nation. However, patients in these settings face significant barriers to care, which are magnified due to the combined problems of a poorly integrated medical neighborhood, fragile access to care, and a majority of patients who are either uninsured or Medicaid recipients. Addressing CHC integration is a particularly compelling topic in California, as California CHCs care for 15% of all community health center patients in the United States and surpass the national average in percent of CHC patients who are racial/ethnic minorities, at or below 200% of the federal poverty level, uninsured, or with Medicaid coverage.

For CHCs to be successful in achieving these missions, they need strategies to overcome the significant barriers to cultivating relationships with patients and other providers and integrate into the medical neighborhood.

Study design and methods

In this Blue Shield of California Foundation funded study, *Facilitating Care Integration in California Community Health Centers*, we sought to answer two important questions through literature reviews, environmental scans, interviews, and collaboration with an advisory committee representing key stakeholders in CHCs and safety net settings in California. The two questions we sought to answer

were: 1) How integrated are community health centers with their surrounding medical neighborhood? and 2) What strategies have community health centers implemented to improve integration for their patients, in the interfaces between primary care-specialty care, primary care-oral health care, primary care-diagnostic imaging services, primary care-pharmacy services, and primary care-hospital care? (Figure 1). The primary care-behavioral health interface is covered in a separate report under this program.

Figure 1: The five domains of primary care integration included in this report

From those questions, we also examined the literature on conceptual models for integration strategies, and unable to find a model that classified integration-centered interventions and innovations in these settings, we derived a conceptual model for our findings (Figure 2).

Our findings present evidence-based and practical examples of innovations, interventions and models that CHC and safety net settings have employed to better integrate with the medical neighborhood in California and across the nation. Finally, we assembled a compendium of resources that CHCs can utilize for guidance on implementation, development, and better understanding of the models.

Results

We defined Barbara Starfield's pillars of comprehensiveness and coordination of care as the two faces of effective integration between primary care and the rest of the medical neighborhood. Comprehensiveness entails bringing the medical neighborhood into the medical home, making it the "one-stop shop" for all health-related needs, while coordination requires seamless interactions with outside participants and providers in the medical neighborhood.

At its heart, care integration is about strengthening relationships among care providers and between care providers and patients, recognizing that patients – within their primary care home – are at the hub of the medical neighborhood. Various strategies have been developed to achieve these aims, and we classified those interventions, models, and innovations into a number of categories within each of the pillars of Comprehensiveness and Coordination. *Comprehensiveness* – or bringing services into primary care – includes a) Colocation of additional services into primary care; and b) capacity building of primary care providers. *Coordination* – or building relationships with services outside of primary care - includes these categories: a) defining and developing a network of service providers; b) improving patient navigation and engagement; and c) improving communication and collaboration. Cultivating personal and technology-assisted relationships and activating patients for a greater role in their care are foundational for all these categories.

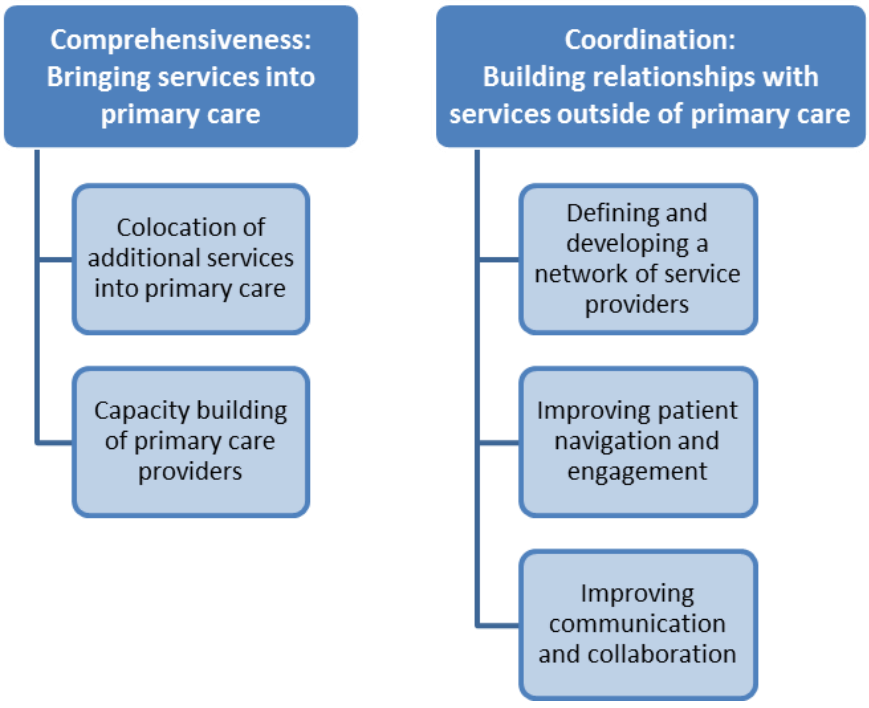

Figure 2. Conceptual model for community health center integration strategies

Classifying the innovations in each of our domains yielded a matrix of integration strategies, summarized in Table 1.

Table 1: Summary of findings

	Comprehensiveness: Bringing services into primary care		**Coordination: Building relationships with services outside of primary care**		
	Colocation of additional services into primary care	Capacity building of primary care providers	Defining and developing a network of service providers	Improving patient navigation and engagement	Improving communication and collaboration
Specialty Care					
Specialty services within primary care	√				√
Hospital-CHC partnerships	√				√
Specialty-trained NPs/PAs	√				
Increasing PCP capacity through training and electronic consultation		√	√		√
Building formal partnership network			√		
Integrated systems			√	√	√
Improving access to specialty care through use of care coordinators				√	√
Increasing the availability and coordination of specialty care through telemedicine			√	√	√
Oral Health					
Dental services on site	√				√
School-based dental services	√				
Academic-CHC partnerships	√				√
Training PCPs and non-dental professionals		√			

	Comprehensiveness: Bringing services into primary care		Coordination: Building relationships with services outside of primary care		
	Colocation of additional services into primary care	Capacity building of primary care providers	Defining and developing a network of service providers	Improving patient navigation and engagement	Improving communication and collaboration
Community Partnerships			√	√	√
Mobile dental services			√	√	
Patient education				√	
Virtual Dental Homes			√	√	√
Teledentistry			√	√	√
Diagnostic Imaging					
In-house imaging	√				
Private facility discounts			√	√	
Integration with hospitals			√		√
Access to a public hospital			√	√	
Referral coordination				√	√
Referral guidelines					√
Pharmacy Services					
In-clinic 340B pharmacy	√		√		√
In-clinic medication therapy management	√				√
Pharmacist Networks			√		
Patient assistance program enrollment navigators				√	
Pharmacy-based medication therapy management			√		
Prescription fill information shared					√

	Comprehensiveness: Bringing services into primary care		Coordination: Building relationships with services outside of primary care		
	Colocation of additional services into primary care	Capacity building of primary care providers	Defining and developing a network of service providers	Improving patient navigation and engagement	Improving communication and collaboration
with PCP					
Provision of medication organization services by pharmacy				√	
Hospital Care					
PCP in the inpatient setting	√				
Direct communication between PCPs and hospitalists			√		√
Electronic exchange of information between hospitals and primary care			√		√
Coordination of care using a hospital-based nurse			√	√	√
Coordination of care using a primary care-based nurse			√	√	√
Post-discharge access to primary care medical home				√	√

The context in which a CHC operates offers opportunities and places constraints on its ability to cultivate relationships with the medical neighborhood. For example, CHCs in county systems with shared electronic medical records may have opportunities for seamless electronic communication that are not feasible in more fragmented systems. As a tool for CHCs seeking to implement these strategies, we classified each intervention based on depth of the integration, magnitude of the costs of the intervention (e.g., financial, human resources), and an estimate of the burden level on the primary care provider/practice and the medical neighborhood partner to implement and sustain the intervention. We have also provided links to practical resources for implementation.

Conclusions

Care integration is a timely topic given the expansion of CHCs propelled by the Affordable Care Act. As CHCs in California and around the nation transform into Patient-Centered Medical Homes, their success will depend in part on the extent to which they can effectively build the pillars of comprehensiveness and coordination in the medical neighborhood. This report offers a practical guide to care integration, providing both a framework for thinking about strategies as well as links to practical tools and examples of implementation.

Implementing the strategies described in this report requires engaged leadership, capital and human resource investments, maintenance costs, relationship-building within the practice or the neighborhood, and evidence for sustaining the efforts. Realizing the primary care pillars of comprehensive and coordinated care requires strengthening the level of integration between community health centers and their medical neighborhoods.

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Introduction

In 1992, the great scholar of primary care, Dr. Barbara Starfield, articulated the four pillars of primary care practice: first contact care, continuity of care, comprehensive care, and coordination of care [1]. These pillars are the foundation for all future elaborations of key primary care attributes. In 2007, four primary care professional societies coalesced around a vision for primary care -- the Joint Principles of the Patient-Centered Medical Home, an elaboration of Starfield's four pillars [2]. In 2008, Elliott Fisher introduced the idea that the primary care medical home lives in a medical neighborhood – the specialists, ancillary services, pharmacies, hospitals, long-term care facilities, home health agencies, and other services that the medical home needs to provide comprehensive care to its patients [3].

Barbara Starfield's pillars of comprehensiveness and coordination of care are the two faces of effective integration between primary care and the rest of the medical neighborhood. Comprehensiveness entails bringing the medical neighborhood into the medical home, making it the "one-stop shop" for all health-related needs, while coordination requires seamless interactions with outside participants and providers in the medical neighborhood.

Care integration between the medical home and its surrounding medical neighborhood is increasingly complex [4]. The typical primary care clinician interacts with as many as 229 other providers in 117 different practices. The probability that a clinician visit would result in a referral to another clinician almost doubled from 4.8 percent in 1999 to 9.3 percent in 2009 [5]. In the Commonwealth Fund's 2011 survey of adults with health problems, 42% of US respondents reported a problem with the coordination of their care, such as clinical information not shared among providers, test results not available when seeing a different provider, and ambulatory providers being uninformed about hospital or surgical care [6]. Two out of five US providers say their practices function without staff that can assist with care coordination, leaving this unreimbursed job to overly busy providers [5].

In addition to facing care coordination challenges, community health center (CHC) patients face severe limitations in accessing care. Nationally, 30% of providers report not accepting new Medicaid patients; in California, where Medicaid physician payment rates are very low, 43% do not see new Medi-Cal patients [7]. In 2008, 59% of providers reported that they provided some "charity care" to uninsured patients, but the number of uninsured patients in their practices was very limited [8]. While community health centers provide primary care to the uninsured, finding specialists for uninsured patients can be difficult or even impossible.

Care coordination barriers are magnified for CHC patients due to the combined problems of a poorly integrated medical neighborhood and fragile access to care. The great majority of CHC patients are either uninsured or Medicaid recipients. Addressing CHC integration is a particularly compelling topic in California. California CHCs care for 15% of all community health center patients served in the United States, and surpass the national average in percent of CHC patients who are racial/ethnic minorities, at or below 200% of the federal poverty level, uninsured, or with Medicaid coverage [9].

A 2013 Blue Shield of California report, "Health Care in California, Leveling the Playing Field," found profound health inequities between low and high income Californians and their experience of care [10]. Many of the underpinnings of these inequities stemmed from the quality and caliber of caregiving relationships, including patient-provider rapport, continuity of care, and connectedness. Patients in CHCs often experience fragmented, discontinuous, and inadequate care, largely due to the lack of sustainable integration with the larger medical neighborhood.

This is a critical period in CHC history and therefore this study is timely. Nationally, CHCs are the medical homes for 22 million patients, and these numbers are expected to double in the next few decades [11]. A 2012 Blue Shield of California Foundation Report, "California's Community Clinics and Health Centers: Taking Initiative in a New Healthcare Landscape," argued that the Affordable Care Act presents significant challenges and opportunities for health centers, and to thrive, CHCs will need to increase collaboration *within clinics*, *among clinics*, and *with the community* [12].

CHCs have adopted a broad range of strategies to improve care coordination and improve the comprehensiveness of services offered. Kate Neuhausen and colleagues describe 6 models for how health centers obtain specialty care [13]. Similar strategies have been adopted to improve integration with oral health, pharmacy, diagnostic imaging, and hospital services. There is wide variation in which strategies are economically and/or logistically feasible in different health center settings.

This report reviews the literature on integration for community health center patients. The questions discussed in the report are: 1) How integrated are community health centers with their surrounding medical neighborhood; and 2) What strategies have community health centers implemented to improve integration for their patients? For the purposes of this report, integration of care includes both strategies to bring other services into the medical home (comprehensiveness) and to improve the flow of referrals and information with outside providers (coordination). The strategies adopted are designed to overcome a variety of challenges, including access to services, uptake of services, and sharing information across providers. The report examines integration between primary care and specialists, oral health care, diagnostic imaging facilities, pharmacy services, and hospitals.

Methods

Our study consisted of literature reviews, environmental scans, Advisory Committee feedback and interviews in four domains that interface with primary care in CHC or safety net settings: a) specialist care; b) oral health c) diagnostic imaging; d) pharmacy; and e) hospitals. Behavioral health is covered in a separate report under the Blue Shield of California Foundation's Facilitating Care Integration program. Detailed description of the methods and classification schema are described in Appendix A.

Conceptual model

We derived a conceptual framework from our findings that best synthesized the varied approaches toward care integration into a cohesive model of integration strategies (Figure 1).

Care integration is ultimately reliant on the strength of the relationships between primary care, other providers in the medical neighborhood, and patients. Therefore, relationship building is central to the overall conceptual model and is fundamental to every classification described here. All the innovations described within our conceptual model can be seen as strategies toward the goal of strengthening relationships within the medical neighborhood. Each of these strategies requires commitment by the organizations and staff participating in the neighborhood, successful engagement of patients as central figures in the neighborhood, and cultivation of inter-organizational and intra-organizational relationships. These principles have has well-articulated in customer service research for many years. In fact, Gittell and other service management scholars have proposed that while relationships between customer service providers and customers are important to build customer satisfaction and loyalty, the relationships between service providers are increasingly significant [14]. Hence, relationship building in the medical neighborhood is central to the overall conceptual model and is the backdrop of every classification described here.

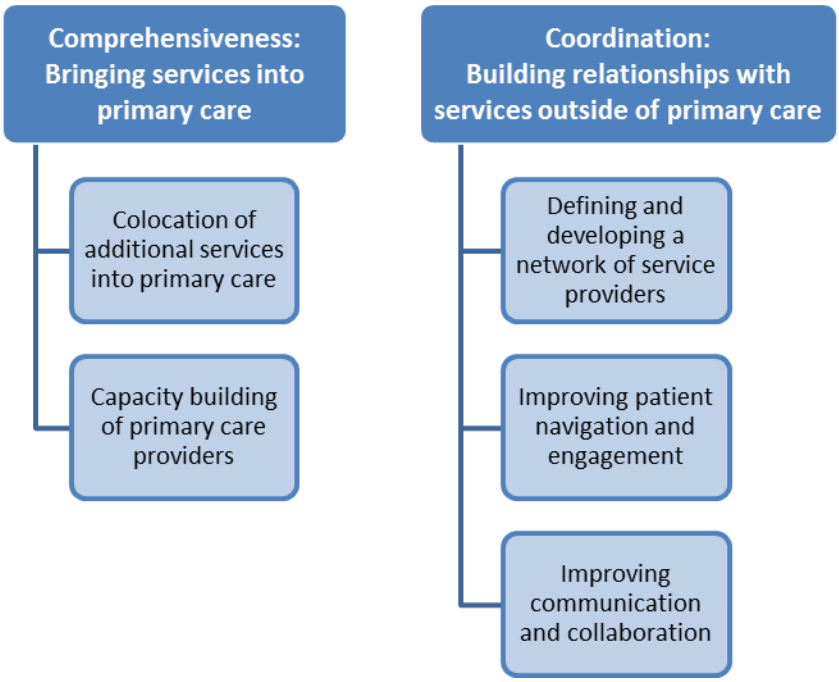

Figure 2. Conceptual model for community health center integration strategies

We classify strategies, interventions and innovations into two realms, a) Comprehensiveness: Bringing services into the primary care home, and b) Coordination: Building relationships with services outside of primary care.

Comprehensiveness, or bringing services into the primary care home, includes colocation of additional services or capacity building of primary care providers. *Colocation* involves the provision of different services in a shared physical location, with the premise that geographic and physical proximity will improve access to the services for the desired population [15]. Physical proximity of services alone is not sufficient for successful integration, but it can facilitate ongoing communication and development of relationships and agreements on processes, roles, and responsibilities. Though many public and private sector organizations, including CHCs, have long supported this concept of "one stop shopping," and some studies suggest greater patient and family satisfaction, improved provider knowledge and better integration, colocation is under-utilized in the primary care safety net setting [15]. Barriers include: high infrastructure costs and capital expenses, low economies of scale, regulatory limitations in public-private partnerships, insufficient physical space and/or appropriate office configurations, professional staffing limitations, billing and reimbursement, inter-professional conflict, and privacy/confidentiality concerns with sharing data [15, 16]. *Building the internal capacity* of the CHC primary care provider staff to deliver more specialized services is another important strategy that provides new or enhanced skill sets so as to expand services provided directly within the medical

home. It is limited by range of specialty services, scope of practice and licensure restrictions, and time/training investments.

Within the category of Coordination-building relationships with services outside of primary care, we classified approaches into three categories that enhance coordination by: a) defining and developing a network of service providers; b) improving patient navigation and patient engagement within or between settings; and/or c) improving communication and collaboration. *Defining and developing networks of service providers* is one key approach to coordination. This can occur alone or in hybrid approaches, and sometimes precedes the ability to enhance navigation, communication or collaboration, as CHCs frequently determine the range of accessible service providers in any of the domains, create service or practice agreements within the network, articulate payment and reimbursement requirements, and negotiate mutual expectations for patient care and processes [13]. Defining and developing these networks, however, is not necessarily a prerequisite for the other coordination strategies, though they may harmonize well. In some cases, CHCs have adopted innovations that improve *patient navigation* between and within settings, which specifically assist the patient in making simple or complex transitions of care, access needed equipment, medication, services, transportation, appointments, benefits and other health care fundamentals. Additionally, successfully *engaging patients* as partners in their own care and activating them in the health care experience is an important part of patient navigation [17]. Finally, *improving communication and collaboration* is also a distinct subcategory of interventions, which requires the CHC and other medical neighborhood members to devise strategies in which they can more effectively partner in the care of the patient, often by applying information technology, workflows, protocols or additional staff, and adopting methodology to share in decision-making. While technology is sometimes a solution to an integration challenge, in many cases, it is also considered a tool. Patient activation is also of paramount importance regardless of the domain.

It should be noted that many strategies do not singularly fit into one classification. Some CHCs adopt multiple strategies at the same time, and there is overlap in many of the approaches articulated in this report. For example, telemedicine may assist with increasing the capacity of primary care clinicians to diagnose and treat a broader range of conditions and it may also help to improve communication between specialist and primary care providers.

The following case will utilize a fictitious, but not uncommon, scenario in a CHC setting to distinguish the various classifications within this conceptual model and to highlight the various challenges CHCs often experience as they strive for integration.

Case study: Do-Good CHC

Do-Good CHC is a well-established CHC in Do-Good County, California. For many years, it has been trying to obtain access to dermatology services for its patients. The Chief Medical Officer (CMO) was charged with finding a solution to this problem. The first solution proposed was to contract with a local dermatologist to provide on-site consultations within the CHC (*Comprehensiveness - Colocation*). The dermatologist provided direct patient care in the CHC for half a day each week and was reimbursed at an hourly rate by the CHC. Relationship building was essential to optimizing this service, as the mere presence of the dermatologist did not lead to the CHC optimally utilizing her skills. Meetings between primary care physicians and the dermatologist, referral protocols and bidirectional feedback supported the relationship between the CHC providers and the dermatologist.

As the organization added new service locations, it was impossible for the dermatologist to provide this type of service in multiple settings and the Chief Financial Officer (CFO) questioned if the model was cost-effective. The CMO then decided to implement a program in which all of the PCPs could undergo advanced training in diagnosing common dermatologic conditions. Every PCP was required to complete a two day course in dermatology for primary care and the organization purchased advanced dermatologic equipment for the clinics (*Comprehensiveness - Capacity Building*). A year later the clinic experienced substantial PCP turnover, leading the CMO to wonder whether it was feasible to ensure that all important competencies were achieved and maintained; the CFO also complained about the costs of perpetually training new PCPs. The CHC needed to explore other strategies.

The CMO began to identify dermatologists who were open to new patients within a twenty-mile radius of their practices, and met with local dermatology groups to discuss access barriers and to hear the concerns of the specialists. These relationships were cultivated so that both parties trusted one another and could hold each other accountable. Subsequently, they negotiated service arrangements for Do Good CHC patients, specifying the maximum numbers of patients that could be referred every month, arranging discounted services for the uninsured, and setting a timeline for review of the agreement terms (*Coordination - Developing Networks*). Some of the dermatologists felt that certain diagnoses could be made remotely, if they were provided with high resolution images of the skin findings and a clear consultative question from the PCP. PCPs began to utilize this tele-dermatology approach to initial consultations (*Coordination - Communication and Collaboration*), which allowed dermatologists to prioritize patients who should be seen in person. One dermatology group agreed to provide a Grand Rounds for the PCPs at Do Good CHC to educate them on ideal consultative questions, a refresher on primary care dermatology, and approaches to communication through the technology interface. As part of the service agreements, the dermatologists agreed to provide clear and thoughtful responses to the consults in a timely fashion, with specificity on treatment plans and follow-up

requirements if indicated.

Given their previous experience with high no-show rates of Do-Good CHC patients, the dermatologists insisted that Do-Good CHC provide navigation support to patients needing in-person visits. Do-Good CHC dedicated some medical assistant time to coordinating dermatology referrals, scheduling and confirming appointments, securing transportation and interpretation services if needed, and following-up with patients after the appointment. In addition, the medical assistants used health coaching techniques to engage the patients to become active participants in the referral process. They made sure that patients understood why they were being referred, agreed with the need for the referral, and wrote down questions to ask the dermatologist (*Coordination – Patient Navigation & Engagement*).

Integration of specialty care and primary care

Although one in four visits to primary care providers (PCPs) in community health centers results in a specialty referral [18], CHCs often struggle to obtain specialty access for their patients [13, 18, 19]. The paucity of specialists willing to care for CHC patients leads to major imbalances in supply and demand. Wait times for patients to obtain specialty appointments can be as long as one year, with potentially life-threatening implications, including disability, chronic disease complications and death [18, 20]. Poor access to specialty services contributes to known racial/ethnic health disparities [18, 21]. Even when referrals are made, about 30% of CHC pediatric patients never receive the needed service, with a range of 10-73% depending on specialty [22]. Similar findings have been reported for adult CHC populations [23].

These challenges for CHC patients do not affect only those who are uninsured. Medicaid patients are less likely than privately insured patients to receive needed specialty care. As mentioned earlier, some specialists are not willing to accept patients with Medicaid due to low payment rates [7], and Medicaid patients are more likely than privately insured patients to miss appointments because of transportation, childcare, language or other barriers [19, 24, 25]. In some situations, patients can access specialty services through safety net hospitals committed to caring for patients irrespective of payer source (public hospitals, some academic centers, critical access hospitals), but more often than not, demand exceeds the supply of specialists [24].

In this section, we will describe a number of strategies to secure access to specialty care and ensure effective integration between primary and specialty care through comprehensiveness or coordination. Many of the innovations described overlap multiple domains.

Enhancing comprehensiveness through colocation of additional services into primary care

Specialty services within primary care. In many settings, community health centers opt to provide *in-house specialty care* for a select number of specialties, often based on demand, identified gaps in access, and/or specialist willingness to participate. In these scenarios, the CHC incurs fixed costs and specialists may be paid a flat fee for their time, bill directly for their services, or -- less commonly -- provide the services pro bono. Legal and regulatory barriers surrounding health center scope of practice expansions are well described in a 2009 California Healthcare Foundation brief [26]. There are

also many operational and policy barriers to meaningfully embed contracted specialists (colocation) or technology into primary care practices. These include, but are not limited to: high overhead costs, costly technical requirements and ongoing support, inadequate space/equipment for specialty care providers, reimbursement, legal and regulatory barriers, and support staff limitations [27, 28]. However, some CHCs have been successful in making these models work.

Hospital-CHC partnerships have increased access to specialists by providing specialty services on site in CHCs, as exemplified by ACCESS Community Health and the University of Chicago Medical Center (UCMC) [24]. ACCESS developed contractual relationships with UCMC specialists to provide direct service in the health center, and was able to modify its scope-of-practice designation with the Health Resources & Services Administration (HRSA) to include a number of different medical specialties. *Developing teaching communities* through residency programs is another strategy to bring specialists to CHC settings. This can be accomplished through hospital-based residency programs that create CHC partnerships or through teaching health centers, which are models in which the health centers own and operate the teaching program by training primary care residents themselves. For example, the Family Health Center of Worcester, Massachusetts has built a strong referral network of both hospital-based and volunteer on-site specialists through its teaching health center role [13, 29]. The National Association of Community Health Centers (NACHC) describes access to specialist care as a distinct advantage of the teaching health center model [29].

Examples of specialty services within primary care and hospital-CHC partnerships

A general internist-run liver clinic, in which providers from Atlanta's Grady Memorial Hospital provide care at CHC sites, has been shown to increase access to Hepatitis C treatment for underserved patients. Patients in the liver clinic are predominantly uninsured and minority patients with complicated chronic liver disease and psychiatric disease (40%). Fourteen percent of all patients with liver disease carried diagnoses of Hepatitis C and were treated successfully [30].

The Carolina Health Net, a partnership between an academic health center and community health center, was formed in 2008 to manage vulnerable uninsured patients by providing them access to primary care and ultimately specialty care through the primary care medical home. This partnership, bringing specialists into the primary care setting, has been transformative for thousands of patients [31].

Unity Health Center in Washington D.C. employed the "buy your own subspecialist model" articulated by Neuhausen and colleagues [13], employing a diverse set of specialists in a multi-specialty hub that PCPs can refer to from their thirteen primary care sites. This program has been supported by two

managed Medicaid organizational agreements and the DC Healthcare Alliance [13].

Enhancing comprehensiveness through capacity building of primary care providers

Specialty-trained physician assistants and nurse practitioners to deliver specialty services. An increasing number of specialists are extending their reach by working with specially trained physician assistants and nurse practitioners, who provide services within the primary care setting. Specialist NPs and PAs can also recognize issues that require intervention by the physician specialist.

Examples of specialty-trained NPs or PAs delivering specialty care in CHCs and safety net settings

CareOregon has arranged for PAs to handle acute, nonsurgical orthopedic needs within health centers. They are paid primarily by the health plan, at a rate lower than paid to an orthopedic physician [28]. This model has resulted in timely nonsurgical therapy for management of joint pain, casting and splinting of broken bones, which enable proper healing, reduce joint deterioration and lower the likelihood of surgery [28].

San Francisco General Hospital (SFGH) has developed an NP-operated program for patients with high-risk asthma and chronic obstructive pulmonary disease (COPD) in its hospital-based primary care clinics. The NP provides specialty-level consultation and oversees point-of-service spirometry and patient education with the support of a supervising pulmonologist in both hospital-based and outreach community clinic settings [32]. This program has resulted in increased access, decreased wait times for evaluation and spirometric testing, and in asthmatics, improved symptom control and improvements in NHLBI asthma control status.

Increasing primary care provider capacity through training and electronic consultations. Emerging literature supports the potential of specialist-to-PCP knowledge transfer, enhancing PCP capacity and reducing specialist referral rates due to knowledge diffusion. This strategy places a large burden on the primary care provider for initial education and training, but it is an investment that is lessened over time. Training PCPs allows them to manage more specialized and complex health issues, improving access to care for patients and reserving limited specialist care for more complex patients.

Examples of increasing primary care provider capacity through training and electronic consultations

The eReferral model, developed at the San Francisco General Hospital-University of California San Francisco, uses direct provider-to-provider communication through a shared electronic medical record. Through the system, primary care providers at both county-administered clinics and non-profit FQHCs in San Francisco can send their consultative questions directly to specialist reviewers. Generally one of three outcomes follows: a) the specialist requests more information or further testing, which the PCP can order; b) the specialist deems the referral to be more suited for another specialty or provides the PCP with guidance on how to manage the patient; or c) the specialist arranges to see the patient. Standardized referral processes and iterative communication between providers through eReferrals have decreased wait times for non-urgent visits in nearly all medical specialty clinics by 90%, increased the availability of expedited visits in many specialties, and reduced inappropriate medical and surgical referrals by over 50% [33]. eReferrals have improved PCP understanding of specialty topics and allowed for higher quality referrals. The production of specialty-based guidelines for management of commonly eReferred topics serves as a resource for PCPs within the electronic record [34]. This innovation also coordinates care through a larger network of specialists and enhances communication, so can be considered a hybrid.

Project ECHO (Extension for Community Healthcare Outcomes) was developed at the University of New Mexico, to improve access to care for underserved populations with hepatitis C virus (HCV) infection. The program has now been expanded to multiple conditions. By using basic video-conferencing technology, ECHO specialists train primary care providers, who work in remote community-based settings with minimal access to specialists, to provide evidence-based care for patients with hepatitis C [35]. In a prospective cohort study, patients treated in ECHO sites had similar sustained viral responses as patients treated at the university's HCV clinics (58.2% and 57.5%, respectively, P= 0.89) [35]. Surveys revealed a high degree of PCP professional satisfaction and self-efficacy, as well as a significant improvement in knowledge [36]. The ECHO model was successfully replicated in a large multi-site FQHC, Community Health Center, Inc. in Connecticut, increasing the number of its patients with HCV undergoing treatment and increasing provider confidence in treating HCV in the primary care setting [37]. This too, is considered a hybrid integration strategy as it also expands the service network.

Diabetic retinopathy screening by primary care providers has been accomplished through a partnership between the University of Colorado and Salud Family Health Centers in Colorado. PCPs in the health center were trained to read and interpret retinal imaging for a largely Hispanic population of patients with diabetes. Screening by PCPs decreased the number of patients needing referral to eye care specialists from 1040 to 344, and PCPs correctly identified 90% of problem cases [38, 39]. Most pathological signs on images missed by PCPs were due to abnormalities not covered in the original training. The curriculum has since been updated, and it now includes ongoing education for PCPs

through handbooks and iPad applications such as *eyeBook: A Diabetic Retinopathy Book for Primary Care Providers.*

An Endoscopy Training for Primary Care (ETPC) program, developed by the University of Colorado-Denver Department of Family Medicine and the Colorado Area Health Education Center, teaches PCPs (62% in urban practice, 26% in rural practice) to perform colonoscopies. This program features didactic education in online formats, endoscopy simulator experiences, and proctoring by an experienced endoscopist. At four years after implementation, the original cohort of PCPs had performed over 2300 colonoscopies. Program participants showed significant improvement in knowledge and visual identification of benign and malignant cancer-related lesions [40].

Australian researchers published a co-op model of specialist-generalist collaboration in which certain surgical specialty services in Australia's largely rural Northern Territory are provided through generalists trained by specialists from larger medical centers. These specialists also provide support and back-up as needed. This cooperative model imparts additional skills to general practitioners and increases access for a marginalized population to a range of surgical specialty services [41].

Enhancing coordination through defining and developing a network of service providers

Building formal partnerships in a network. Neuhausen et al. describe the process of building formal partnerships with community hospitals to help CHCs better access specialty care [13]. In one example, Thundermist Health Center, which serves three communities in Rhode Island, created logistical agreements around health information exchanges and interoperability requirements through a network of hospital based subspecialists.

Integrated systems. Denver Health is a long-standing vertically and horizontally integrated system for vulnerable populations in Denver, which set out to unify two important players in the safety net, urban public hospitals and community health centers. In this model, eight FQHCs are integrated with the Denver Health public hospital, reaching 25% of Denver's population. The Denver Health and Hospital Authority governs these relationships and ensures that the patients of the CHCs have access to a diverse range of subspecialists, a shared electronic health record, and a web based referral system [42].

Example of building formal partnerships in a network

Denver Health integrates acute hospital and emergency care with public and community health to deliver preventive, primary and acute care services to over one-third of the Denver population, making it a model system of network development in the safety net. This integration promotes continuity of care for each patient while ensuring that health care is delivered in the most efficient, cost-effective setting. The system is a model for integrated care between CHCs, public hospitals, acute care providers, behavioral health, and social service providers. It consists of the Denver Health Medical Center, Rocky Mountain Regional Trauma Center, 911 Emergency Response system, Community Health Services (8 CHCs and 16 School-based CHCs), Denver Public Health system for the City and County of Denver, Rocky Mountain Poison and Drug Center, 24 hour nurse hotline, and Behavioral Health Services (outpatient and inpatient [42]. More details can be found at http://www.denverhealth.org/about-us/who-we-are/facts-and-figures.

Enhancing coordination through improving patient navigation and engagement

Improving access to specialty care through use of care coordinators. Many CHCs have addressed the challenges of integrating primary care and specialty care by assigning staff to coordinate and facilitate referrals. Alternatively called referral coordinators, patient navigators, or care coordinators, these staff vary in their background and training. They provide relatively cost effective, clinic-based solutions to the challenges of primary care-specialty care integration [13, 19, 28]. There is growing evidence that use of referral coordinators to facilitate care and information sharing improves care coordination with specialists for safety net patients. For example, a retrospective study of referral patterns in an urban community health center system on Chicago's south side found that CHC-embedded referral coordinators were positively associated with specialty access and documented communication [25].

Examples of improving access to specialty care through use of care coordinators

In Minnesota Health Care Homes, a statewide initiative promoting medical homes, the primary safety net hospital in Minneapolis and its ambulatory care practices have deployed "access coordinators." These staff members serve as the primary liaison between patients and their health care providers, brokering communication between primary care and specialty care providers. They understand patients' socioeconomic and environmental circumstances, and they work to help patients overcome these barriers and maximize follow-through with care plans and appointments [28].

Care Oregon, a Medicaid managed care plan, supports two access coordinators who identify and develop relationships with local orthopedic surgeons, who agree to provide surgical care for patients triaged by CHC orthopedic physician assistants (PAs). The access coordinators serve as a single contact for patients and specialists, providing appointment set up, reminders and patient education [28]. They play a very influential role in patient engagement and developing buy-in to the treatment plans.

Enhancing coordination through improving communication and collaboration

Increasing the availability and coordination of specialty care through telemedicine. Telemedicine refers to the use of telecommunications to deliver clinical care [30]. Telemedicine has been used in rural, urban and academic safety-net settings to minimize travel burden for patients between the PCP and specialist and to facilitate the exchange of diagnostic imaging or photos. Telemedicine takes many forms, including live and interactive, store and forward, asynchronous or virtual care. Telemedicine is often used to characterize innovations such as eConsults and Project ECHO described above, which accomplish multiple objectives of increasing internal capacity and enhancing coordination through expanded networks and improved communication and collaboration with specialists. In most cases, the burden for implementing telemedicine programs falls largely on the primary care practice, which must invest resources in technology and equipment, information infrastructures, workflows, human resource capacity, training, and memoranda of understanding or legal agreements with the specialists and software vendors. Methods used to compensate specialists for telemedicine services include the CHC directly employing the specialist on a salaried basis for designated time devoted to telemedicine, the CHC paying a fee to specialists as independent contractors, or having specialists bill a third party plan on their own.

Medicare began paying for telemedicine services in 1997 under the Balanced Budget Act. Though the range of covered services is growing, telemedicine still faces restrictions based on the specific services, location of those services, and categories of providers. In many states, such as California, Medicaid programs also reimburse for telemedicine services. Some private payers have also authorized reimbursement for telemedicine services [43]. Synchronous telemedicine consultations are growing rapidly, particularly in rural areas, to expand access to specialty care, without the inconvenience of travel expenses [44]. Though telemedicine can largely be classified as a communication and collaboration strategy, it is also highly dependent on developing networks of specialists and

agreements/memoranda in which they operate, and building relationships that are cultivated to assure success.

Examples of increasing the availability and coordination of specialty care through telemedicine

A telemedicine program for diabetic retinopathy screening was developed by Community Health Center, Inc., a large multi-site health center in Connecticut, using EyePACS, a Picture Archive Communication System (PACS), to increase the rate of diabetic retinal screening exams. Trained medical assistants use specialized cameras to take retinal photos during primary care visits. Ophthalmologists from the Yale Eye Center provide consultative reports and recommendations through a secure online platform, and do interpretation remotely. This telemedicine program increased screening rates, reduced specialty burden, and lowered costs. Fewer than 15% of patients required follow-up or intervention, which has greatly reduced the burden on specialists [45, 46]. Frequent feedback between the PCPs to the ophthalmologists has helped troubleshoot problems, strengthen communication, build trust, and maintain the programs longevity.

Telepsychiatry was successfully implemented in an Arizona CHC serving a large Latino community. Using a standard Webcam with minimal operational requirements underserved Hispanic patients received internet-based videoconferencing care for depression. The patients who received care from psychiatrists through this medium had longer sustained improvements in depression compared to patients receiving usual care [47].

While no one solution can be applied to the diverse clinical settings in which community health centers deliver their services, practices and organizations seeking to integrate primary care and specialty care should be aware of various options to successfully integrate and coordinate specialty care for patients in underserved settings. Table 2 summarizes the domains of primary care-specialty care literature review findings and characterizes the level of integration, burden on the PCP/practice, burden on the specialist/practice, and relative cost for implementation or maintenance.

Table 1. Summary of specialty care and primary care integration strategies*

	PCP-Specialist Integration Level	PCP/Practice Burden	Specialist Burden	Cost to clinic	Neighborhood or Practice Participation
Enhancing comprehensiveness through colocation of additional services into primary care					
Specialty services within primary care	High	Low	High	$$	Neighborhood
Hospital-CHC partnerships	High	Moderate	Low	$$	Neighborhood
Enhancing comprehensiveness through capacity building of primary care providers					
Specialty-trained NPs/PAs	Moderate	Low	Moderate	$	Mixed
Increasing PCP capacity through training and electronic consultations	Low	High	Low	$$	Mixed
Enhancing coordination through defining and developing a network of service providers					
Building formal partnerships in a network	Moderate	Moderate	Moderate	$	Neighborhood
Integrated systems	High	Moderate	Moderate	$$	Neighborhood
Enhancing coordination through improving patient navigation and engagement					
Improving access to specialty care through use of care coordinators	High	High	Low	$	Practice
Enhancing coordination through improving communication and collaboration					
Increasing the availability and coordination of specialty care through telemedicine	Moderate	High	High	$$	Neighborhood

***** note that some strategies overlapped multiple domains and are considered hybrid approaches

Integration of oral health services and primary care

Poor access to dental services and growing racial/ethnic disparities in oral health is a growing concern in the safety net [48]. Prior to the ACA, 44 million Americans had no health insurance, but 100 million were without dental coverage. Most uninsured and underserved populations rely on Medicaid for dental coverage, yet many states are cutting budgets and eliminating dental benefits [48]. Models of primary care-oral health integration require addressing financing and delivery barriers, developing service linkages and community resources, and strengthening the safety net itself through capacity building. Federal law and regulations related to the Early Periodic, Screening, Diagnosis and Treatment (EPSDT) program require that states provide medically necessary dental services for children, but state policies for adult dental coverage vary greatly - some states do not cover dental services at all, some limit coverage to specific adult populations, such as pregnant women, and others limit coverage to conditions associated with trauma or disease [49]. Nationally 24% of health center services provided are dental services (14-20% per year in California) [50], and over 70% of health centers provided oral health services on site as of 2005 [51]. Given that many health centers have co-located dental services (*comprehensiveness*), *coordination* seems to be more of the focus for dental integration, either for those CHCs without onsite dental care or for those unable to obtain adequate reimbursement for these services.

A 2008 California Healthcare Foundation (CHCF) study reported a myriad of barriers that CHCs in California face in expanding dental services [52]. These barriers fell into four main categories: start up and operating costs; payer mix, reimbursement and uncompensated care; recruitment, retention and training of staff; and leadership and management factors such as quality measures and efficiency. In 2011, an Institute of Medicine Report, “Improving Access to Oral Health Care for Vulnerable and Underserved Populations,” further underscored the health disparities that exist in oral health, and the role of the safety net and Medicaid programs in tackling these problems [53]. Their recommendations included a number of strategies that Community Health Centers are adopting or considering, including: working with states to increase Medicaid and Children’s Health Insurance Program (CHIP) reimbursement rates and address scope of practice barriers; providing non-dental healthcare professionals with training and skills to perform oral screenings and preventive services; and training dental professionals to care for complex, underserved patients in community-based settings.

Preventive dental care treatment reduces the incidence of oral disease and is a cost-effective proposition for Medicaid and other insurers, as it leads to reduction in costly emergency department visits [51].

Enhancing comprehensiveness through colocation of additional services into primary care

Dental services on site. Colocation of dental services within CHC settings is relatively common in California health centers and others across the nation, as described earlier.

Example of dental services on site

New Mexico Health Commons Model: In the health commons model [56], patient-centered oral health care is delivered by an interdisciplinary team, in locations where medical, behavioral, social, public health, and oral health services are colocated. However, they realized that colocating was an initial, but not single step and created an interdisciplinary, holistic approach to delivering oral health care and coordinating services for their patient population. Depending on the needs of the patient, the service providers may include a primary care physician or provider, a dentist or dental hygienist, a nurse or nurse's assistant, a social worker, or a community health worker, who share physical space and are trained to collaborate effectively within their common locations. This model also applies principles of colocation and interdisciplinary care to health professions students and resident trainees. Health care has improved due to better coordination and information transfer [52].

School-based dental services. Additionally, many CHCs offer School-Based dental services in elementary and middle school settings, which is essentially *reverse colocation*, bringing the services to the schools where children spend most of their days. School-Based Health Centers (SBHCs) in California and elsewhere usually provide preventive and restorative care, along with education [54, 55].

Academic-CHC partnerships have also increased access to dental care in CHC settings. Such a partnership has been very successful at the Marshfield Clinic in Marshfield, WI, a rural multi-specialty group practice and family health center. They developed partnerships with both medical and dental schools and equipped multiple dental centers with space and equipment to train 4th year dental students on site, providing for a model of integration that begins in training and increases the capacity of their CHCs to offer oral health services. They are also training medical students in this model in a shared learning experience that cultivates communication between different professionals during education and training. Leveraging the promise and successes of this arrangement, they subsequently started a rural-based, CHC-housed dental school. It is the hope that this new school will become a pipeline for rural safety net dental providers interested in practicing in community-based settings [57].

Enhancing comprehensiveness through capacity building of primary care providers

Training PCPs and non-dental professionals. CHCs are often faced with critical access concerns, in which medical patients cannot necessarily receive dental care, and may have to ration who can access it. When state budgets and dental provider resources are scarce, many CHCs have focused on limiting dental services to certain populations, such as children, pregnant women, patients with diabetes, cardiovascular disease or HIV; or internal capacity building of medical and nursing staff to provide direct preventive dental care to populations of focus [58]. One such example of internal capacity building is in the training of non-dental professionals (PCPs, nurses) to provide oral health screenings and fluoride varnish to children, in order to prevent tooth decay. It is essential that these clinicians receive adequate training and encouragement, as well as support and referral resourced to be successful, as was demonstrated in a large cross-sectional study of PCPs in 69 Pediatric and 49 Family medicine practices serving Medicaid-eligible children in North Carolina [59]. If training is done well, PCPs can achieve accuracy in adequately identifying abnormal findings or carious lesions in children [60]. However, some CHCs have reported challenges with such programs, as certain services (e.g. fluoride varnish) may not be reimbursable in the medical clinic [57].

Example of training PCPs and non-dental professionals

Neighborcare Health is an 18 site CHC in Seattle, WA with over 48,000 patients. Faced with a dilemma of having to ration dental services when the state cut its dental budget, they decided to focus on populations at high risk of dental disease through a medical-dental integration initiative that used Quality Improvement methodology to create and spread a sustainable integration program [57]. The implemented a program in which medical providers and nurses were trained to provide oral health screenings, oral risk assessments using a standardized assessment tool, and apply fluoride varnish for children ages 0-5. They educated the entire PCP workforce with “knee to knee exams,” giving guidance on how to identify problems, and creating bidirectional workflows for patients between medical and dental departments. They also utilized registered dental assistants in an expanded role and trained them to handle more treatments in the medical home [57]. Through this, they were able to greatly increase capacity for dental services for children, and based on this success, were able to implement other successful campaigns that improved access to dental services for pregnant women and other high risk patients, since demand on dental providers decreased.

Enhancing coordination through defining and developing a network of service providers

Community partnerships. Defining networks of service providers for dental care is often a challenge for CHCs, as limited numbers of external practices accept Medicaid for dental services [51, 52]. CHCs must often work in partnerships to ensure adequate access to dental services when they cannot provide them within their walls or require higher levels of care for their patient populations.

Example of community partnerships

Troubled by survey results that showed oral health was the single most troubling health problem for a Harlem based population, the Columbia University School of Dental and Oral Surgery, worked in partnership with community-based organizations to create and implement the Community DentCare Network [61, 62]. The program provided preventive and comprehensive treatment from fixed and mobile facilities for clients in Harlem, regardless of patients' ability to pay, through public middle school–based dental programs; a mobile dental clinic for the Head Start population during the school year and to reach the elderly population during the summer; and community health center sites offering comprehensive dental services.

Enhancing coordination through improving patient navigation and engagement

Mobile dental services. Many health centers have utilized mobile dental services to increase access to oral health care for their patients. By meeting patients where they are, these programs improve utilization and patient engagement [52]. These are either clinics that are self-contained in motorized vehicles, or that provide transportation to fixed sites where more comprehensive services can be provided. Examples of mobile health programs that provide oral health and other services to patients in homeless, school community, home based and recreational settings include: Clinic Sierra Vista's mobile program in California which reaches out to homeless persons in shelters, motels as well as children in schools; Project HOPE of Shasta Community Health Center in Redding, CA, which provides dental, medical and mental health services to disenfranchised communities through a mobile health program [63], and many others.

Patient education. Another example of supporting patient navigation and engagement in the area of oral health is a model implemented at Terry Reilly Health Services in Nampa, Idaho, a CHC located in rural town with a large migrant and seasonal farmworker population. To better engage patients and help them understand the role of oral health in their overall health, they created a strategy to cultivate

more informed consumers. While in the dental clinic, which was geographically separate from the medical clinic, patients were provided with a personal view of their oral health status, using Phase Contrast Microscopy. This view provided patients with a visual of their oral health status and reviewed indicators of poor oral health and the presence of bacteria. This program had a positive impact on patient engagement in self-management of their oral health. However, the lack of co-location between medical and dental care providers, coupled with the rural geography, did result in high rates of incomplete referrals. However, they did achieve a 40% decrease in oral health risk factors for patients that subsequently completed dental care, and created prompts in the EMR to remind PCPs to initiate or follow through on dental referrals for patients [57].

Enhancing coordination through improving communication and collaboration

Virtual dental homes and teledentistry. As described above, CHCs and other safety net settings have used multiple strategies to improve communication and collaboration. Additional models utilized by two California safety net settings are described here.

Examples of virtual dental homes and teledentistry

The Pacific Center for Special Care at the University of the Pacific, Arthur A. Dugoni School of Dentistry has created a "Virtual Dental Home" in sites throughout California [64]. The goal is to provide oral health services in locations “where people live, work, play, go to school and receive social services”. They have partnered with a number of funding organizations to implement this demonstration project to bring much-needed oral health services to these underserved populations. The Virtual Dental Home promotes collaboration between dentists in dental offices and community-based dental hygienists and dental assistants and also has elements that cross into multiple categories, such as advanced training of Registered Dental Hygienists and Dental Assistants; portable imaging equipment and an internet-based dental record system, collection and uploading of electronic dental records such as X-rays, photographs, charts of dental findings, and dental and medical histories to a secure website where a collaborating dentist reviews, and referring patients to dental offices for procedures that require the skills of a dentist.

The Children’s Hospital of Los Angeles’ eHealth program opened a number of preventive dental clinics on school campuses in rural communities of Woodlake, Lindsay and Cutler-Orosi [65]. These clinics are equipped with videoconferencing units to facilitate telehealth consultation with faculty dentists at Children’s Hospital Los Angeles and the USC School of Dentistry.

Table 2. Summary of oral health-primary care integration strategies*

	PCP-Specialist Integration Level	PCP/Practice Burden	Specialist Burden	Cost to clinic	Neighborhood or Practice Participation
Enhancing comprehensiveness through colocation of additional services into primary care					
Dental services on site	High	Low	High	$$	Practice
School-based dental services	High	Low	High	$$	Neighborhood
Academic-CHC partnerships	High	Low	Moderate	$$	Neighborhood
Enhancing comprehensiveness through capacity building of primary care providers					
Training PCPs and non-dental professionals	Low	High	Moderate	$$	Practice
Enhancing coordination through defining and developing a network of service providers					
Community partnerships	Moderate	Moderate	Moderate	$	Neighborhood
Enhancing coordination through improving patient navigation and engagement					
Mobile dental services	High	Moderate	High	$$	Neighborhood
Patient education	Moderate	Low	Moderate	$$	Neighborhood
Enhancing coordination through improving communication and collaboration					
Virtual dental homes	High	Low	High	$$	Neighborhood
Teledentistry	Moderate	High	High	$$	Neighborhood

***** note that some strategies overlapped multiple domains and are considered hybrid approaches

Integration of diagnostic imaging services and primary care

Imaging technologies are an important diagnostic service that primary care providers frequently need to provide high-quality care. Imaging technologies include standard x-rays (generally of the chest and skeleton), mammography, ultrasound, computed tomography (CT scan), magnetic resonance imaging (MRI), dual energy x-ray absorptiometry (DEXA) scans for bone density, nuclear medicine scans, and interventional radiologic procedures such as angiograms. Standard x-rays and ultrasounds can be considered lower-cost, with the other services being high-cost. For imaging services, the two main problems facing CHCs are access-- both timely access and, most importantly, financial access for the uninsured -- and quality -- ensuring that imaging reports are promptly returned to primary care and that proper patient follow-up is provided for abnormal studies.

In thinking about imaging access it is helpful to create a grid:

Lower-cost imaging services	Medicaid
	Uninsured
High-cost imaging services	Medicaid
	Uninsured

Medicaid patients have reasonable financial access to both lower-cost and high-cost imaging, though high-cost services may require payer authorization. Medicaid patients may have more difficulty with prompt, timely access, but imaging facilities and radiologists often participate in Medicaid. (e.g. Medi-Cal payment for CT head scan is 75% of the Medicare payment). In one study, only 2% of Medicaid CHC patients had difficulty accessing diagnostic testing (low-cost), with 16% reporting problems receiving high-tech (high-cost) services [18].

For uninsured patients, imaging services, especially high-cost services, are virtually inaccessible. A limited number of imaging facilities provide significantly reduced rates for the uninsured. Lower-cost imaging facilities are most accessible financially for the uninsured if they are available within the CHC, where sliding scale rates greatly improve affordability. Because imaging services for Medicaid patients do not appear to create major problems, we focused on strategies to promote integration of imaging

services for the uninsured through colocation, internal capacity building or some domain of coordination. Many of the strategies we found cross multiple domains.

Enhancing comprehensiveness through colocation of additional services into primary care

***In-house imaging*.** A number of CHCs have standard x-ray and ultrasound facilities within their walls, allowing financial access through sliding scale rates. In Cook's national survey of 439 community health centers, 47% had lower-cost diagnostic imaging services on-site [18]. This strategy creates considerable costs for the health center because the equipment is expensive and the CHC must also pay for radiology technicians and for a radiologist to interpret the images. High-cost imaging services are rare within community health centers. However, community clinic consortia can purchase such facilities and services on behalf of all their member clinics; for example, the Alaska Tribal Health Consortium owns a CT scanner and MRI machine.

An example of extending in-house diagnostic imaging while reducing financial burden on the CHC is offered by mobile mammography. Mammography vans, often created and owned by hospitals, park outside of low-income clinics on designated days and provide free or reduced cost mammography to eligible participants. One study found that 29% of the women receiving mammograms in mobile mammography units had never been screened for breast cancer or had not had a mammogram in more than five years, suggesting that mobile mammography units successfully reach people who might otherwise not receive imaging services [66]. Another study found that mobile mammography units were more successful than usual care facilities at reaching women who were uninsured, low income, and who had not been seen by a primary care provider within the last year [67].

Enhancing coordination through defining and developing a network of service providers

***Private facility discounts*.** If no public hospital exists, one way that uninsured patients can access high-cost imaging services is to go to the emergency department to have a CT or MRI scan ordered and then to request that their bill be written off due to inability to pay. In some communities, local hospitals may waive the costs for a select number of uninsured patients. CHCs and other safety net settings often serve as the liaison for such arrangements on behalf of their patients.

Examples of private facility discounts

New Hampshire has systematized private facility discounts for diagnostic imaging. Under statewide rules, hospitals waive all charges for uninsured patients whose income is below 125 percent of the federal poverty level (FPL) and discount charges on a sliding scale for patients earning from 125 percent to 200 percent FPL. Some hospitals are more generous, waiving all charges for uninsured patients up to 200 percent FPL [68].

Project Access San Diego arranges for some uninsured patients to receive high-cost imaging services donated by hospitals. The project builds on the example of the "tin cup" model of access, which relies on health centers and their advocates requesting free or low-cost services [13]. Rather than every CHC scrambling to provide care, Project Access coordinates a network of healthcare providers who donate medically necessary health care to qualified individuals [69]. This represents a hybrid model of coordination: expanding and cultivating the service network and patient navigation.

National efforts also help to connect CHCs and their patients with discounted diagnostic imaging. For example, the CDC has a website that assists in finding free or low-cost mammography services. Eligible persons include women between 40 and 64 years of age with no insurance coverage for mammography and with yearly income at or below 250% of poverty [70]. For California, the program Every Woman Counts (1-800-511-2300) provides free mammograms for low-income and uninsured women [71]. Many state Departments of Public Health or private foundations offer similar services for cancer screening (breast, cervical, colon) for uninsured patients.

Integration with hospitals. In a national study, more than half (54%) of uninsured patients from 439 CHCs had difficulty accessing high-tech (high-cost) services. Health centers integrated with hospitals or academic medical centers had better patient access for the uninsured than free standing health centers, presumably because the hospitals were willing to provide lower-cost imaging services to their own patients [18].

Access to a public hospital. Another strategy for both lower- and high-cost imaging services is referral to a nearby public hospital (if one exists), where free or reduced-cost services may be available for the uninsured. The access problem with this strategy is that demand often outstrips capacity for public hospital imaging services, so waits can extend many weeks. San Francisco General Hospital's eReferral mechanism [72] has reduced waits for CT scans from 14 to 5 days and MRI scans from 175 to 33 days since its implementation in 2007. Ultrasound wait times similarly dropped by around 50% [73]. By

utilizing specialist reviewers to determine the appropriateness of the imaging request, extract more information on the consultative question, and suggest alternatives to the PCP when indicated, eReferral improved access by decreasing unnecessary demand for these tests. Again, these models take advantage of developing and expanding a network of service providers, but also allow for improved collaboration and communication.

Enhancing coordination through improving patient navigation and engagement

***Referral coordination*.** Quality issues may be addressed through applying personnel and protocols that bridge gaps between CHC providers and diagnostic imaging centers. Some CHCs report that some hospital-based imaging facilities do not notify them promptly if studies are abnormal, and others lack workflows to ensure that abnormal results are seen by the proper clinician and discussed with the patient. A number of health centers have created the position of Referral Coordinator (or other titles as described in earlier section) to track each referral (whether to a specialist or for diagnostic test) to determine whether the patient came to the referral and whether a report was sent back to primary care. Referral coordinators also instruct patients on how to prepare for the imaging studies. Ideally, the referral coordinator would also track whether the referring clinician has notified the patient and arranged follow-up regarding the abnormal test. Such tracking systems are most commonly being used for mammography results.

Enhancing coordination through improving communication and collaboration

Referral guidelines. Ensuring that primary care clinicians follow proper guidelines in ordering imaging studies is another quality issue for CHCs. PCPs often are not sure which study to order – e.g. ultrasound, CT, or MRI, with or without contrast, or when more advanced imaging is indicated. Referral guidelines can help to reduce overuse of imaging studies such as CT scans that expose patients to large doses of radiation, while also ensuring that tests with optimal sensitivity and specificity are utilized. Moreover, primary care providers often need guidelines on how to follow-up on radiologic abnormalities that are incidental, benign or inconclusive. As an example, PCPs often struggle with what the proper follow-up for a very small lung nodule should be. Some health care organizations have embedded such decision support guidelines into their EHRs and the eReferral program at SFGH, described above and in the primary care-specialty care section of this report, has attempted to address these issues [72]. In this system, radiologists at SFGH provide information on imaging indications,

preparation, radiation exposure to patients, useful alternatives, and cost, within the eReferral interface and menu. Additional decision support by trained NPs who provide imaging order screening also helps guide PCPs in the decision-making process.

Table 3. Summary of primary care-imaging integration strategies*

	PCP-Imaging Integration Level	PCP/Practice Burden	Imaging Center Burden	Cost to clinic	Neighborhood or Practice Participation
Enhancing comprehensiveness through colocation of additional services into primary care					
In-house imaging	Low	High	Low	$$$	Practice
Enhancing coordination through defining and developing a network of service providers					
Private facility discounts	Moderate	Low	Moderate	$	Neighborhood
Integration with hospitals	High	Low	High	$$	Neighborhood
Access to a public hospital	Moderate	Low	High	$$	Neighborhood
Enhancing coordination through improving patient navigation and engagement					
Referral Coordination	High	High	Low	$	Practice
Enhancing coordination through improving communication and collaboration					
Referral guidelines	High	Low	Low	$$	Neighborhood

* note that some strategies overlapped multiple domains and are considered hybrid approaches

Integration of pharmacy and primary care

Pharmaceutical therapy is a vital part of healthcare, yet there are significant gaps between primary care and pharmacy services. About a quarter of first-time prescriptions are never filled, and an additional 30-40% of chronic disease medications are discontinued, taken incorrectly, or not picked up on time by patients [74]. Three out of four respondents to a national survey reported forgetting to take, not refilling, or discontinuing medications [75].

Coordination of care between pharmacy and primary care could result in cost savings and improvements to patient care. An estimated $213 billion – or nearly 8% of healthcare spending in the U.S. – could be saved each year through improving prescription management, enhancing medication adherence, and reducing medication errors [74]. Improved medication management would also improve clinical quality. Three-quarters (76%) of adverse drug events resulting in hospitalizations are judged to be preventable [76].

Integration of pharmacy and primary care seeks to remedy a number of important gaps, including barriers to accessing medications, suboptimal dosing or choices of medication, drug interactions, patient lack of understanding, and errors resulting from broken communication between pharmacy and primary care. To address these barriers, a number of pharmacy integration strategies have been explored. Similar to previous findings, many of the innovations, models and interventions described in this section cross over multiple domains in the conceptual framework.

Enhancing comprehensiveness through colocation of additional services into primary care

In-clinic 340B pharmacy. Primary care practices have attempted to secure access to medications by setting up in-clinic pharmacies through the federal 340B pricing program. The program enables eligible organizations, such as some CHCs, to purchase discounted medications from wholesalers and manufacturers. Moreover, the associated Prime Vendor Program established by HRSA facilitates additional discounts. State-specific regulations influence use of the programs. CHCs eligible for 340B pricing may directly operate in-clinic pharmacies or contract with retail pharmacies [77], which expands the service network for pharmacy services.

Use of the federal 340B pricing program by CHCs has reduced drug costs for participants by as much as 50% [52]. This is particularly important given that cost concerns may account for up to a quarter of unfilled prescriptions in low-income urban areas [78]. There are significant regulatory requirements and initial costs for in-clinic pharmacies, but these pharmacies can generate revenue for their clinics that offset other costs. In addition to reducing the cost of medications, in-clinic pharmacies may reduce barriers to picking up medications from another location [77]. In-clinic pharmacies are especially helpful because retail pharmacies in low-income communities are more likely to have short hours and to be out of commonly used medications, as compared to pharmacies in more affluent communities [79]. In addition, in-clinic pharmacies may improve communication and collaboration when they provide feedback to PCPs about prescriptions that were not picked up or were picked up after the recommended refill date [77].

Example of an in-clinic pharmacy

Callen-Lorde Community Health Center, an FQHC in New York City serving a large LGBT community, has contracted with a commercial pharmacy since 2004 to ensure 340B pricing for its patients. In 2010, the health center opened an in-clinic pharmacy, believing that this would reduce barriers to filling prescriptions– such as social stigma and concerns about confidentiality – facilitate opportunities to coach patients on medication knowledge and adherence, and allow an exchange of information through the EHR, so that pharmacists could identify medication errors and providers could track adherence. The clinic anticipates being able to recover its costs within 18 months of operation [77]. Additional information is available through its report at http://nyshealthfoundation.org/uploads/resources/pharmacy-services-community-health-center-case-study-march-2012.pdf

In-clinic medication therapy management (MTM) involves pharmacists collaborating with primary care providers to review and sometimes manage patient medications for chronic conditions within the primary care clinic. MTM programs vary widely, but all include at least some of the following steps by the pharmacist: a) building an accurate medication list [80]; b) establishing the goals for therapy [81, 82]; c) assessing current medications [74]; d) altering medication therapy [74]; e) ensuring that patients understand and agree with the plan [83]; f) communicating the new plan clearly with the patient, caretakers, and all providers [84]; and g) monitoring over time [84]. Pharmacists conducting MTM assess each medication for appropriateness, efficacy, safety (including drug interactions), and adherence [85]. They alter the medication plan through standing protocols or recommendations to the primary care provider, so as to promote safety, affordability, minimal complexity and side effects, and optimal therapeutic benefit [74].

MTM programs vary in their scope of activities for pharmacists, from a limited role in providing consultations to patients or providers [86-89] to pharmacists assuming primary responsibility for optimizing medication therapies [81, 90, 91]. Regulations constrain scope of practice in some states [92]. In the most robust models, pharmacists use standardized protocols to select and initiate medical therapy, adjust dosing and titrate therapy, or stop medications [81, 82, 90, 91, 93, 94] as well as ordering lab tests needed for medication monitoring [90, 91]. The degree of information exchange also varies across models, with more integrated models providing the pharmacist access to medical records and seamless communication with primary care providers [81, 82, 84, 91, 93]. Smith and colleagues (2013) describe a spectrum of pharmacist collaboration that encompasses both these dimensions [85].

There is strong and growing evidence for the effectiveness of MTM. A meta-analysis of 298 studies found that MTM was associated with improved clinical measures (such as blood pressure or LDL cholesterol), fewer adverse drug events, and greater patient knowledge and adherence [95]. The most successful MTM programs emphasize continuity between patient and pharmacist over time [81, 85, 88], empower pharmacists to modify medication therapy using protocols [81, 82, 90, 91, 93, 94], and facilitate seamless communication between pharmacists and primary care providers [88] through shared EHRs [81, 82, 93] or face-to-face communications such as curbside consultations [80, 81, 86].

Examples of in-clinic medication therapy management

Pharmacists embedded in safety net medical homes in Southern California worked with patients with chronically uncontrolled diabetes. They reviewed medical records, evaluated and modified drug therapy, ordered lab tests (e.g., hemoglobin A1c, lipid panel, basic metabolic panel, renal and kidney function), and monitored patients over time, providing follow up care. Compared to other patients with similar baseline, patients working with a pharmacist were three times more likely to reach their goals for glycemic control and more likely to significantly lower their blood pressure [90].

A randomized controlled trial of pharmacist medication management for depression across nine Massachusetts practices found that patients working with pharmacists who helped to select anti-depressants and adjust their dose were more likely to continue using them after six months than patients managed only by their clinician. Moreover, the intervention was effective for patients traditionally considered hard to treat and those who had recently started anti-depressants [96].

Despite demonstrated efficacy of MTM, it has been challenging to develop a cost-effective model [97]. The ability of pharmacists to bill as providers is fundamental to the financial viability of the model

within a fee-for-service environment. In California, PharmDs have traditionally not been able to bill for MTM services, though a new California state law (SB 493: Pharmacy Practice, effective January 1, 2014) may make this possible [98].

Despite growing evidence for the value of integrating pharmacy expertise into primary care, to date only 2% of FQHCs nationally and 1.3% in California report having pharmacy personnel on staff [99]. New legislation may pave the way for greater involvement of pharmacists in medication review and management. The Medicare Modernization Act requires Part D and Medicare Advantage plans to offer MTM to eligible beneficiaries, while the Affordable Care Act creates standard formats for MTM [100].

Enhancing coordination through defining and developing a network of service providers

Pharmacist networks. CHCs may facilitate access to MTM by developing a network of pharmacists able to provide services at an agreed-upon cost. Development of a network is particularly valuable when the volume of work is not sufficient to justify the development of a fixed time position at a CHC. Networks may include commercial, private, and hospital-based pharmacists. Alternatively, some CHCs have partnered with schools of pharmacy, thus providing a training ground for pharmacy students. Pharmacist network development may be facilitated through formal agreements.

Examples of developing a pharmacist network

Community Health Center (CHC), Inc, in Connecticut, pursued a number of strategies to expand their network and secure highly skilled pharmacy professionals to work alongside PCPs in the management of complicated patients or in the delivery of chronic disease services. Their first solution was to try and develop relationships with commercial, private, and/or hospital-based pharmacists. A Connecticut pharmacist network was broad, but CHC was not able to participate in this network because of barriers of cost-effectiveness and sustainability [84]. CHC began to explore a community-academic partnership with the University of Connecticut School (UConn) of Pharmacy, which was seeking ambulatory practice sites for UConn pharmacy faculty to train pharmacy students in community health settings. After extensive discussions, CHCI and UConn forged a mutually beneficial relationship, cemented in a formal memorandum of understanding. Pharmacists and their students provided a broad range of services, with a 90% acceptance rate of pharmacist recommendations by PCPs [101] and significant improvement in patient outcomes [102]. Collaboratively, the pharmacists and PCPs developed numerous workflows centered on care integration within the medical home, and some of these

protocols have been included in ambulatory pharmacy curricula [103].

Enhancing coordination through improving patient navigation and engagement

Patient assistance program enrollment navigators. CHCs may improve access to medications through pharmaceutical company administered patient assistance programs (PAPs) that provide medications at no cost to patients who meet income and other criteria. The application process for PAPs is complex for patients to navigate, and in some cases involve online submissions of paperwork and information, so some CHCs develop enrollment assistance programs. A review of pharmaceutical assistance program evaluations identified 33 evaluations of PAPs in the peer-reviewed or grey literature [104]. The review found evidence in three studies for improved glycemic and cholesterol control. Four economic analyses found $4-11 of benefits for each $1 invested, but many of these cost assessments included only the value of medications received through the program by patients, so they may not reflect a return on investment by the CHC and they do not take into account other cost savings, such a reduced need for care. Limitations in the evaluation designs prevented the authors from synthesizing additional results.

Enhancing coordination through improving communication and collaboration

Pharmacy-based medication therapy management. MTM has also been carried out in commercial pharmacy settings through referrals from PCPs [105-107]. Pharmacy-based MTM also entails review of medications for appropriateness, safety, efficacy, and adherence and offering recommendations to the PCP. However, direct management of medications through standing orders and protocols is generally more difficult.

Examples of pharmacy-based medication therapy management

In the Asheville Project, 12 community pharmacies offered collaborative drug therapy management with primary care providers. This included consultations with patients, assessment of medication regimens, goal setting, and monitoring. Educators within the pharmacy setting offered education around diabetes, asthma, hypertension, and cholesterol. Pharmacists communicated care plans back to providers. Study participants increased control of their blood pressure, cholesterol, and blood glucose. While the cost of medications increased, other claims were reduced, with savings of $725-1,872 per

year, depending on the condition [105-107]. The diabetes 10 City Challenge expanded the Asheville Project model to 10 other cities, with similar results [108].

The Appointment Based Model of Care was developed by Thrifty White pharmacy, an employee owned business based in Minnesota, and has enrolled 27,000 patients at 91 stores. Pharmacists synchronize the refill dates for medications, and patients pick up their prescriptions at monthly face-to-face visits with pharmacists who provide MTM. The pharmacy proactively calls patients a week before their appointment to identify any recent visits that might have resulted in medication changes. In addition to MTM, patient may receive other care at the pharmacy, such as immunizations. A recent study found that participants in the appointment-based model of care were 3.4-6.1 times as likely to be adherent to their medications as control patients. Plans are underway to expand the model to six additional chains and over 600 pharmacies [74, 109, 110].

Prescription fill information shared with PCP. One of the promises of Health Information Exchanges is the potential for PCPs to be able to access information about fill rates for prescribed medications or to receive alerts when medications are not filled or picked up. Given the high proportion of prescriptions that are never filled or that are discontinued by the patient [49], sharing of prescription fill information has the potential to identify at an early stage patients who may not understand or agree with medication recommendations. Large, integrated health systems with shared electronic health records across primary care and pharmacy have successfully facilitated bi-directional communication between PCPs and pharmacists [111]. However, the challenges are greater in non-integrated systems, which often rely on faxes or periodic data transfers to share information back with the PCP. To date, there are few published examples of stand-alone practices that have successfully established feedback mechanisms to share alerts with the PCP.

Prescription Drug Monitoring Programs (known as the Controlled Substance Utilization Review and Evaluation Systems - or CURES - in California) are statewide programs run by pharmacy boards, state agencies, or law enforcement that attempt to prevent diversion of controlled substances. The systems, now operating in 44 states, allow clinicians to access internet-based information about controlled substance prescriptions for patients under their care. There are significant barriers to access and timeliness of information, and the systems only provide information for controlled substances, but PDMP may provide a prototype for information exchange with pharmacies about select medications [112].

Example of prescription fill information shared with PCP

West County Health Centers (WCHC), based in Sonoma County, California, created agreements with local pharmacies to receive prescription fill information for patients at high risk for stroke and heart attack, with a focus on identifying patients who were not consistently taking statins or aspirin. Each month, WCHC would organization and send lists of patients to their respective pharmacies, and the pharmacy would complete the fill information and send it back to WCHC. This program faced a number of challenges. The task of preparing lists of 600-800 patients each month was time consuming. The volume of information they received in return was overwhelming. Complex care nurses had prescription information for up to 100 patients, without easy access to information, such as lab values and blood pressure, which would help them interpret and prioritize the cases. As a result of these barriers, the health center now operates the process in reverse. They provide to each nurse a list of assigned patients and their clinical measures; nurses identify the cases of concern to them, and the health center helps them secure pharmacy data for those select patients. In the future, WCHC hopes to secure consent from high priority patients to activate a feature of the EHR that will allow them to access prescription data directly. One lesson that clinic leadership takes away from the experience is that "Data is not information." That is to say that large volumes of data without strategies to reduce it to manageable and actionable information may frustrate rather than improve care [113].

Provision of medication organization services by pharmacy. For patients with complex medication regimens or cognitive impairment, one simple innovation in coordination of care is the provision of medications by the pharmacy in blister packs [114].

Example of provision of medication organization services

A study conducted with veterans at Walter Reed Medical Center assigned patients to receive 31-day blister packs of medications and pharmacy-based education. Patients receiving the intervention increased their adherence from 61% to 97% and significantly improved their systolic blood pressure. After six months, half of the patients resumed usual care, while the other half continued to receive the blister packs and pharmacy education for another six months. At the end of that time, the usual care group had dropped to 69% adherence, while the intervention group sustained adherence at 96% [89].

Table 4. Summary of pharmacy-primary care integration strategies*

Intervention	PCP-Pharmacy Integration level	PCP/Practice Burden	Pharmacy Burden	Cost to clinic	Neighborhood or Practice Participation
Enhancing comprehensiveness through colocation of additional services into primary care					
In-clinic 340B pharmacy	High	High	Low	$$$	Practice
In-clinic medication therapy management	High	Moderate	High	$$$	Practice
Enhancing coordination through defining and developing a network of service providers					
Pharmacist Networks	Moderate	Low	Moderate	$	Neighborhood
Enhancing coordination through improving patient navigation and engagement					
Patient assistance program enrollment navigators	Moderate	Moderate	Low	$	Practice
Enhancing coordination through improving communication and collaboration					
Pharmacy-based medication therapy management	Moderate	Low	High	$	Neighborhood
Prescription fill information shared with PCP	Moderate	Moderate	Moderate	$	Neighborhood
Provision of medication organization services by pharmacy	Moderate	Low	Moderate	$	Neighborhood

***** note that some strategies overlapped multiple domains and are considered hybrid approaches

Integration of hospital care and primary care

Primary care- hospital integration has the potential to improve the quality of care for patients in CHCs. Hospitals can better manage acute episodes when they can build on the medical and social history that the primary care provider knows well. Better management of conditions may lead to shorter lengths of stay and better patient experiences. In recent years, much attention has been paid to reducing preventable readmissions because preventable readmission to hospitals exacts a significant financial and human cost in the United States. About three-quarters of readmissions for Medicare patients are potentially preventable, representing an estimated $12 billion in potential cost savings each year [115]. Readmission rates are highest for Medicare and Medicaid beneficiaries [116], with one in five Medicare patients re-hospitalized within 30 days [115]. Unnecessary readmissions can be considered a surrogate measure for poor care coordination between hospital and primary care.

Although the majority of people admitted to a hospital report having a usual source of care, one in three adults discharged from the hospital do not see a clinician outside of the hospital within a 30-day time period [116]. There is growing evidence that primary care follow-up after hospitalization reduces the rate of readmissions [117]. Nearly half of patients discharged from the hospital experience at least one medical error in the post-discharge period, and many of these errors are preventable through improved communication between the hospital and primary care providers [118]. Despite these findings, there is a lack of standardization in hospital discharge procedures for the transfer of patient data to primary care providers for proper follow up care [118-120]. The hospital discharge summary (physician-dictated, transcribed reports) is the most common method for documenting the details of a patient's hospital stay and arrangements for post-discharge follow-up [121], yet primary care providers do not consistently receive this information, even when they do follow-up with patients after a hospitalization. A review of literature found that only 12-13% of primary care providers had received a discharge summary at the time of their first post-discharge visit with the patient; moreover, key information such as test results and discharge medications was often not included [115, 122].

Hospitals around the country are employing a number of strategies to reduce readmission rates and better integrate care. Few proposed solutions are anchored in the primary care setting, in part because the onus of communicating a patient’s hospitalization is often on the hospital. Recommendations for content, format, and timeliness of hospital communication to primary care medical homes can be found in published guidelines from the Joint Commission, the Society of General Internal Medicine, and the Society of Hospital Medicine, among other organizations [118, 123, 124]. However, both the hospital and the primary care medical home have a role and responsibility in the coordination of

patient care and in the effort to provide high quality care while reducing cost and preventable re-hospitalizations [125].

Strategies to promote coordination between primary care and hospital care fall on a spectrum of care integration. The most integrated model involves a primary care provider delivering inpatient care, though with the advent of hospitalists, this is increasingly less common [118, 126]. A less integrated and still uncommon practice involves the primary care provider and hospitalist speaking directly during the patient discharge process. A more common practice is the use of a hospital-based nurse (advanced practice nurse or registered nurse) to coordinate care at the time of discharge to home, primary care, or both. In the models described in this report, the nurse provides tailored care and education for patients, ensures that post-discharge follow-up appointments are made at primary care sites, and sometimes facilitates the transfer of patient information from the hospital to primary care providers. The most common care coordination practice is limited to the transfer of information through the hospital discharge form, through a shared electronic medical record system or via fax, mail, or hand-delivery. Finally, care coordination can involve primary care practices guaranteeing prompt access to post-discharge patients. These strategies are not specific to CHCs, but all are applicable to diverse primary care settings. Many of the models for coordination fit into a combination of the three coordination approaches, and, as in earlier sections, represent hybrids.

Enhancing comprehensiveness through colocation of additional services into primary care

Primary care providers in the inpatient setting. It is now uncommon for primary care providers to care for patients in the hospital setting. In 2006, less than one third of hospitalized Medicare beneficiaries 66 years and older received inpatient care from their PCP, down from 44.3% in 1996 [126]. However, this remains an important integration strategy in some parts of the country, particularly rural areas. A report published by the Center for Studying Health System Change (HSC) interviewed primary care providers and staff from small or medium sized practices in the United States. One primary care clinician explained: “We try to provide seamless care for people. I am still one of the few providers that sees patients in the clinic and the hospital, which makes it easier [to coordinate care] because when people go to the hospital, I control their whole hospitalization and who they and I refer to” [127]. “Social rounding” has emerged as a less intensive form of colocation of PCPs in the hospital setting in an era of hospitalists. In social rounding, PCPs visit their patients during their hospital admission and communicate with the hospital care team, though they do not directly provide inpatient care.

Example of primary care providers in the inpatient team

West County Health Centers in rural Sonoma County, California has developed a structured system of social rounding. West County clinicians have an allotted two hours a day for one week every eight weeks for full time providers and every 16 weeks for part time providers for social rounding at one of the three main hospitals that they work with. When a West County patient visits the ED or is admitted to the hospital, the hospital clerk informs the social rounder who in turn informs the care team nurse and PCP. Social rounding allows for West County primary care team members to get critical and timely information about their hospitalized patients. The FQHC also recently piloted a nurse-to-nurse conferencing program that will soon be expanding across their health centers. In this program, the primary care team nurse and the hospital nurse are able to videoconference about each patient through an iPad connection, which further supports the transfer of crucial care information that may not appear in the hospital discharge summary form [128].

Enhancing coordination through improving communication and collaboration

***Direct communication between primary care providers and hospitalists*.** One study found that primary care providers who spoke directly with hospitalists and patients within one day of discharge reduced medication discrepancies by 70%. In this intervention, hospitalists were responsible for calling the primary care clinician when the patient was nearing discharge. Following the phone contact, the primary care clinician was instructed to contact the patient within 24 hours of discharge [129]. Studies have also found that primary care providers appreciate speaking with hospitalists directly via telephone [130]; however, direct communication between primary care and hospital providers is an infrequent practice [121, 131]. Barriers to direct communication include lack of time, lack of knowledge about whom to contact [132], and incongruous schedules of primary care providers and hospital-based providers [133].

Electronic exchange of information between hospitals and primary care. Direct communication between hospital and primary care providers during the discharge process is rare. A review of 55 observational studies published between 1970 and 2005 found that only one in five primary care providers reported being notified consistently about discharges, while only 3% reported participating in discharge discussions [121]. Electronic medical records and exchange of information is one

promising method of improving communication between caregivers in the hospital and in the primary care medical home.

Although use of EMRs is rapidly growing [134], fueled by programs such as the Medicare and Medicaid EHR Meaningful Use incentives [135], little is known about the utility of existing commercial EMRs for care coordination between hospitals and primary care. Most studies on EMR effectiveness in care coordination focus on custom-built systems at large medical centers, rather than the EMRs used by most practices in the United States [136]. A qualitative study of 60 providers and thought leaders across the United States found a lack of interoperability between these commercial EMRs and information systems in most hospitals. Furthermore, many of these sites were scanning paper charts into the EMR so that they were not searchable electronically. In most non-integrated settings, PCPs do not reliably receive notification of a patient's hospitalization or discharge summaries by the time they are needed for follow-up care [136, 137]. When effective information exchange via EMR is in place, including through well-developed relationships and agreements between primary care health centers and hospitals, it appears to be very helpful during care transitions [137, 138].

Example of electronic exchange of information between hospitals and primary care

The Cambridge Health Alliance discharge transfer intervention took advantage of the communication stream available through a shared EMR within an integrated care system. The computer-generated patient discharge form was prepared by the discharge nurse and physician and transferred electronically to the primary care medical home. The discharge form both notified the primary care team of the patient's hospitalization and provided details on the diagnosis, medication changes, and discharge plan. The discharge form ultimately became part of the patients' permanent medical record [120].

Aquidneck Medical Associates, Inc., a primary care practice in Portsmouth, Rhode Island (RI), deployed its EMR to exchange secure information such as patient problem lists, medications, allergy lists, and immunizations, with other practices and the local hospital. Aquidneck is able to transmit a patient's continuity of care document electronically to the local hospital. After the patient is released from the hospital, an Aquidneck nurse retrieves the patient's hospital records, and schedules a primary care follow-up appointment [139].

In January 2013, Marin General Hospital, in Marin County, California, implemented the CareInSync Carebook platform to improve care transitions for high-risk patients. Carebook allows for real-time,

multidisciplinary care collaboration through a mobile network that includes six local community based organization. After six months, and more than 60,000 secure messages exchanged, primary care follow-up appointments scheduled pre-discharge increased by 30% [140].

***Coordination of care using a hospital-based nurse*.** There are several examples of hospital and primary care coordination using a hospital-based nurse, also called a care manager, nurse discharge advocate, transition coach, or nurse coordinator. In most cases, the nurse provides education on medications, offers self-management support, and promotes timely outpatient follow up with the primary care medical home. These examples are a hybrid of coordination approaches, as they improve communication and collaboration, foster improved patient navigation between settings and are made possible through the cultivation of relationships between hospitals and primary care health centers.

Examples of coordination of care using a hospital-based nurse

In the Community Care of North Carolina enhanced primary care case management program, nurse care managers assist Medicaid recipients with multiple unstable medical conditions in scheduling the post-discharge PCP visit, preparing for the appointment by gathering medication and personal health records, developing a list of questions, securing transportation, and addressing other barriers that may impede patients' ability to make the appointment. Care managers also interface with the primary care medical home and provide the PCP with pertinent information about the hospitalization and other social and environmental concerns [141]. Intervention patients experienced 17.4 fewer readmissions per 100 patients than the usual care cohort [142].

In the Reengineered Discharge (RED) program at Boston Medical Center, where the majority of patients come from local community health centers, a nurse discharge advocate (DA) works with patients during their hospital stay to conduct medication reconciliation, provide patient education, and assist with making timely post-discharge follow-up appointments with the primary care provider [143]. If the patient does not have a primary care provider, the DA helps the patient find one based on patient preferences. DAs emphasize the importance of follow-up appointment and assist the patient with transportation and other necessary planning (e.g., day care). The DA also ensures that the primary care provider receives a discharge summary. In this program, a pharmacist also follows-up with patients post-discharge to review medications. Participants in the intervention group had a lower rate of hospital utilization than those receiving usual care and accounted for 33.9% lower observed cost. Furthermore, participants receiving the intervention could identify their diagnoses and the name of their PCP more often than usual care participants, and they were more likely to report following up

with their PCP, compared to usual care participants [143].

A large Colorado-based capitated delivery system conducted a randomized trial of transition coaches, assigning hospitalized patients to receive a transition coach or usual care. The transition coach (usually a nurse) encourages patient self-management, shared decision-making, and visits with the PCP after discharge to review medications and care plans. The transition coach first meets with the patient in the hospital and conducts a home visit within three days of hospital discharge. Intervention patients had lower re-hospitalization rates at 30 & 90 days than control subjects, although there was no significant difference at 180 days. Intervention patients had lower re-hospitalization rates for the same condition that precipitated the index hospitalization at 90 days and at 180 days compared with controls. Mean hospital costs were lower for intervention patients than control patients at 180 days [144].

The University of California, San Francisco has developed a Heart Failure Program in which hospital-based nurse coordinators communicate with primary care providers about hospitalizations, educate the patients about their condition and medications using teach back, make follow up calls with the patients post-discharge, and ensure that patients have a follow-up visit scheduled with their PCP within one week of discharge. Communication with the PCP starts with an e-mail sent when the patient is admitted followed by a more thorough message when the patient is discharged. UCSF's Heart Failure Program reduced both 30-day and 90-day readmissions for patients 65 and older by 30%. By preventing 40 patients a year from being readmitted to the hospital, the program has cut Medicare billing by at least $1 million annually [145].

Coordination of care using a primary care-based nurse. Less common in the literature is the use of a primary care-based nurse who coordinates care transitions from the hospital, though the practice seems to be anecdotally widespread in various iterations. Primary care -based nurses conduct many of the same activities as hospital-based nurses, including reconciliation of medications, providing self-management support, ensuring receipt of hospital records by the PCP, and encouraging follow-up care. These innovations are also a hybrid of coordination themes, including elements of improved communication and collaboration as well as patient navigation.

Examples of coordination of care using a primary care-based nurse

The Cambridge Health Alliance developed a low-cost model, requiring no additional personnel, in which a patient discharge form was electronically transferred to an RN at the patient's primary care site. The discharge form notified the primary care medical home that the patient had been discharged from the

hospital. After receipt of the discharge form, the medical home RN called the patient within 24 hours to assess the patient's medical status, review the discharge form, answer patient questions, and schedule a follow-up appointment. The patient discharge form and nurse's telephone notes were forwarded electronically to the PCP who reviewed the discharge–transfer plan and modified it as necessary. More intervention patients than control patients followed up with the primary care medical home within 21 days of discharge (40.8% vs. 14.9%) and more of the recommended outpatient workups in the intervention group were completed (31.3% compared to 11.5%) [120].

WellSPACE Health, a multi-site FQHC in Sacramento, California that offers a full continuum of care for physical health, mental health, and addiction treatment, developed a respite Interim Care Program (ICP) to ease care transitions for their vulnerable patients. In the ICP program, WellSPACE works with four hospital systems to care for homeless patients who are well enough to be discharged from the hospital but not able to meet their medical needs while homeless. These patients are moved to a local 18-bed Salvation Army where a WellSPACE nurse provides wound cleaning and other acute care. Case managers at the Salvation Army site also transport patients to their WellSPACE medical home for post-discharge follow up appointments. This program has been successful in reducing inpatient bed-days and hospital costs [146]. A video describing this program can be found at http://www.wellspacehealth.org/interim_care.htm

Ravenswood Family Health Center in East Palo Alto, CA is piloting a nurse coordinator program to manage care transitions with Stanford hospital. When a Ravenswood patient visits the ED or is admitted to the hospital, the Ravenswood nurse receives notification through an answering service and fax within 24 hours. Through this process, the Ravenswood nurse is able to retrieve patient discharge summaries, scan them, and add them to the patient's electronic chart. The nurse speaks with all patients within one week of discharge from the hospital and may also schedule a follow-up nurse or PCP visit with the patient. During this conversation or visit, the nurse performs medication reconciliation, reviews red flag warning signs, reminds the patient about any follow-up visits at Ravenswood, and does a nursing assessment on certain conditions. Any concerns are brought immediately to the PCP. Challenges that have arisen so far include: clarifying which discharged patients are active Ravenswood patients, managing patients without medical insurance, and coordinating warm-handoffs between hospitalists and PCPs when a patient is dealing with home health or other complex needs that cannot be adequately described in the discharge summary [147].

Post-discharge access to primary care medical home. While effective integration between hospitals and primary care practices requires that hospital take initiative to notify primary care practices of admissions or discharges, the responsibility on the primary care practice is to ensure timely follow-up for post-discharge patients. This can be accomplished through advanced clinic access that allows flexible scheduling for in-person visits within 24-72 hours of hospital discharge [138] and is also a powerful patient navigation model. Furthermore, some organizations, recognizing the benefits of post-discharge primary care follow-up, are offering financial incentives for these visits. The New York based Capitol District Health Plan allows practices to bill at the highest evaluation management code level for primary care visits within seven days of hospital discharge and provides a $150 bonus payment for each such visit [138].

Pending finalization, a new proposal from the Centers for Medicare & Medicaid (CMS) for the Medicare physician fee schedule will allow for billable non face-to-face complex chronic care management services. These services, which will fall within a defined care plan for patients with two or more chronic conditions, would include management of care transitions from the hospital. Although the CMS has not specified how much it will pay for these complex care management services, the proposal does specify that eligible practitioners can bill Medicare for non–face-to-face complex care management when it is at least an hour of time during a 90-day period [148].

Table 5. Summary of hospital-primary care integration strategies*

Intervention	PCP-Hospital Integration Level	PCP/Practice Burden	Hospital Burden	Cost to clinic	Neighborhood or Practice Participation
Enhancing comprehensiveness through colocation of additional services into primary care					
PCP in the inpatient setting	High	High	Low	$$$	Practice
Enhancing coordination through improving communication and collaboration					
Direct communication between PCPs and hospitalists	Moderate	Moderate	Moderate	$	Practice and Neighborhood
Electronic exchange of information between hospitals and primary care	Moderate	Low	Moderate or low	$$	Practice and Neighborhood
Coordination of care using a hospital-based nurse	High	Low	High	$	Neighborhood
Coordination of care using a primary care-based nurse	High	High	Low	$$	Practice and neighborhood
Post-discharge access to primary care medical home	Low	High	Low	$$	Practice

***** note that some strategies overlapped multiple domains and are considered hybrid approaches

In summary, we have classified the innovations and models in the various interfaces into a matrix of integration strategies, categorized by specific domains in the conceptual model and reflecting the multiple domains in which an innovation may overlap. This summary is reflected in the Table below.

Table 6: Summary of findings

	Comprehensiveness: Bringing services into primary care		**Coordination: Building relationships with services outside of primary care**		
	Colocation of additional services into primary care	Capacity building of primary care providers	Defining and developing a network of service providers	Improving patient navigation and engagement	Improving communication and collaboration
Specialty Care					
Specialty services within primary care	√				√
Hospital-CHC partnerships	√				√
Specialty-trained NPs/PAs	√				
Increasing PCP capacity through training and electronic consultation		√	√		√
Building formal partnership network			√		
Integrated systems			√	√	√
Improving access to specialty care through use of care coordinators				√	√
Increasing the availability and coordination of specialty care - telemedicine			√	√	√
Oral Health					
Dental services on site	√				√
School-based dental services	√				
Academic-CHC partnerships	√				√
Training PCPs and non-dental professionals		√			

	Comprehensiveness: Bringing services into primary care		Coordination: Building relationships with services outside of primary care		
	Colocation of additional services into primary care	Capacity building of primary care providers	Defining and developing a network of service providers	Improving patient navigation and engagement	Improving communication and collaboration
Community Partnerships			√	√	√
Mobile dental services			√	√	
Patient education				√	
Virtual Dental Homes			√	√	√
Teledentistry			√	√	√
Diagnostic Imaging					
In-house imaging	√				
Private facility discounts			√	√	
Integration with hospitals			√		√
Access to a public hospital			√	√	
Referral coordination				√	√
Referral guidelines					√
Pharmacy Services					
In-clinic 340B pharmacy	√		√		√
In-clinic medication therapy management	√				√
Pharmacist Networks			√		
Patient assistance program enrollment navigators				√	
Pharmacy-based medication therapy management			√		
Prescription fill information shared					√

	Comprehensiveness: Bringing services into primary care		Coordination: Building relationships with services outside of primary care		
	Colocation of additional services into primary care	Capacity building of primary care providers	Defining and developing a network of service providers	Improving patient navigation and engagement	Improving communication and collaboration
with PCP					
Provision of medication organization services by pharmacy				√	
Hospital Care					
PCP in the inpatient setting	√				
Direct communication between PCPs and hospitalists			√		√
Electronic exchange of information between hospitals and primary care			√		√
Coordination of care using a hospital-based nurse			√	√	√
Coordination of care using a primary care-based nurse			√	√	√
Post-discharge access to primary care medical home				√	√

Conclusions

CHCs are the medical homes for over 5 million patients in the state of California [149]. CHCs face many challenges in delivering care to patients with limited resources. While these challenges are present when care is received within the medical home, they are more pronounced as patients require services that may not be available within the medical home. While only 3% of California CHCs had received NCQA Patient-Centered Medical Home (PCMH) recognition in 2012, 20% had applications pending and nearly 50% had plans to submit applications by 2014 [149]. Clearly, CHCs in California are committed to optimizing the care that patients receive. As the CHCs in California and around the nation transform into Patient Centered Medical Homes, their success will depend on the extent to which they can effectively achieve the pillars of comprehensiveness and coordination in the medical neighborhood. For a PCMH to succeed, Fisher asserted, it needs to operate in a "hospitable and high performing medical neighborhood" [3].

CHCs have risen to the challenges of often not having this "hospitable and high performing medical neighborhood" by enveloping a panoply of health services into their environments and seeking to develop relationships that support them. Additionally, many CHCs have taken part in system efforts to improve coordination (e.g., eReferral systems and telehealth) and to build bridges within the medical neighborhood (e.g. social rounding). Even with the examples of gains and innovations, there remain many instances of insufficient resources, poor communication and large gaps in fulfilling the goal of a truly integrated medical neighborhood. This report has identified a number of strategies that CHCs and similar safety net settings have employed to better coordinate care for their populations and offers a conceptual framework for considering integration strategies. Rather than reinvent the wheel, CHCs can learn from successful models of integration achieved by their peers in diverse settings and use this conceptual framework to logically consider how to deploy such strategies.

Our report has some limitations. Of note, the peer-reviewed literature does not capture all the efforts CHCs are testing, implementing and sustaining. Additionally, we recognize that the medical neighborhood involves a large and complex array of institutions, providers, services, organizations, consumers and stakeholders. This report focused on a select number of domains of integration and is not exhaustive. However, the framework can be applied to multiple domains in which primary care interfaces with the other components of the medical neighborhood.

Regardless of the innovation, implementing these strategies requires engaged leadership, up-front investment, maintenance costs, feasibility assessments, and relationship building within the practice or

the neighborhood. Application of the important principles of practice transformation, such as the Ten Building Blocks of High Performing Primary Care [150] and the Eight Safety Net Medical Home Change Concepts [17] is very useful in maintaining transformation in these settings. To better construct the primary care pillars of comprehensive and coordinated care, CHCs are encouraged to strengthen care integration across the medical neighborhood.

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Appendix A: Expanded methods

Our study consisted of literature reviews, environmental scans, Advisory Committee feedback and interviews in four domains that interface with primary care in CHC or safety net settings: a) specialist care; b) oral health c) diagnostic imaging; d) pharmacy; and e) hospitals.

Literature Review

We searched Medline, PubMed, Google Scholar and other sources for peer-reviewed studies conducted in the United States or other Western countries that focused on underserved primary care settings. We used a combination of search terms depending on the specific domain of the search, frequently including terms such as, but not limited to: community health, CHCs, Federally Qualified Health Centers, FQHCs, safety net, primary care, underserved, and health center, accompanied by search terms related to the domains such as specialty, specialist, integration, coordination, pharmacy, pharmacist, hospital, inpatient, diagnostic imaging, diagnostic services, oral health, dental, and dental services. Additionally, we sought to understand if there was preexisting conceptual framework in the literature for the strategies CHCs have employed to better integrate into the medical neighborhood, and if not, to create one.

The literature review was supplemented by reference lists from identified articles and by articles identified through an environmental scan described below. We selected studies that reported on the outcomes and cost of integration and added descriptions of promising integration practices, particularly when they included detailed information that could be helpful to practices seeking to emulate their work. Overall, the studies varied considerably in the types of innovations described, the geographical location, sector (public-private), primary care setting (CHC vs. other primary care practice settings), study design and methods (case-control studies, literature reviews, systematic reviews, descriptive or retrospective studies, cost analyses, reports from the field, etc.). We then used an iterative abstraction process to identify those with highest level of applicability to CHC and safety net settings, and in cases where this was not possible, selected those that could be broadly applied in diverse primary care settings.

Environmental Scan

We also conducted environmental scans to gather information about existing and emerging programs as well as resources related to the innovations, including implementation and practical tools. We searched grey literature, accessed organizational websites that commonly focus on safety net and CHC settings, and conducted Internet searches using many of the keywords described above. Through this process, we found briefs, reports, training manuals or materials, program and practice toolkits, presentations, legislation, standards, and additional websites. Many of the practical and implementation resources can be found in Appendix B.

Advisory Committee Feedback

We hosted two in depth meetings of an 11 member Advisory Committee in October 2013 (teleconference) and January 2014 (in-person), in which we sought feedback on the report and additional examples of innovations in integration. Prior to the initiation of the literature review, the Advisory Committee members provided feedback on the proposed focus areas and deliverables. They recommended that the literature review and environmental scan should provide actionable resources with links to examples or tools and that it should provide a variety of integration strategies suitable to CHCs that vary in geographic location, size and stage of integration. Detailed notes from both of the Advisory Committee meetings were assembled and reviewed, and guided the search and scan processes as well as the nexus for the report deliverables. Advisory Committee members included clinical and executive leadership from California based Community Health Centers and Community Health Partnerships (Chief Medical Officers, Medical Directors, Directors of Quality Improvement and Health Education, Informatics Officers), the Chief Integration Officer of the San Francisco General Hospital, the Executive Director of the San Diego Council of Community Clinics, a Director from the California Primary Care Association, a Medical Home Manager, a Director of Talent and Culture for a CHC Consortium, and the Center for Care Innovations.

Interviews

Finally, based on recommendations from the Advisory Committee and research team, we conducted interviews with innovators where possible, through formal verbal conversations or electronic communications and informational requests. Detailed notes were composed from these verbal interviews, and additional program materials and documents were provided by some of the participants.

Each member of the research team focused on one of the five content areas. Organization of the final review was conducted through the development of matrices to capture the key intervention elements, evaluation design, and findings.

The context in which a CHC operates offers opportunities and places constraints on its ability to cultivate relationships with the medical neighborhood. For example, CHCs in county systems with public hospitals may have shared networks of specialists or electronic medical records with networks and resources that are otherwise not available to non-profit FQHCs, who must interact with multiple specialists and hospitals in the public and private sector. Accordingly, the study team used an iterative process to categorize each strategy by the depth of the intervention, general magnitude of the costs of the intervention (e.g., financial, human resources), and the estimated burden level on the primary care provider/practice and medical neighborhood partner to implement and sustain the intervention (Table 7). Feedback on the classification schema by the Advisory Committee was incorporated.

Table 7. Classifying integration strategies

	Low	Moderate	High
PCP-Neighborhood Domain Integration Level	Minimal interaction between the PCP/office and neighborhood domain; care may be coordinated through verbal, paper or electronic means, but not consistently	Closer collaboration between the PCP/office and neighborhood domain; may be co-located services or direct access to patients records and information through electronic or other means	Advanced level of communication, collaboration and shared decision-making between PCP/office and neighborhood domain, with full participation as joint parties in the care of the patient
PCP/Practice Burden	Set up and maintenance require minimal investment in operational, human, time or other resources by the PCP/office	Set up and maintenance require more investment of operational, human, time and other resources by the PCP/office; investment often is larger in startup phase and maintenance burden is lower	Set up and maintenance require significant investment of operational, human, time and other resources by the PCP/office; investment remains high and necessary to sustain
Specialist Burden	Set up and maintenance require minimal investment in operational, human, time or other resources by the specialist/service	Set up and maintenance require more investment of operational, human, time and other resources by the specialist/service; investment is often up front and lessened over time	Set up and maintenance require significant investment of operational, human, time and other resources by the specialist/service; investment remains high and necessary to sustain
	$	**$$**	**$$$**
Cost to PCP/clinic	Minimal cost for the PCP/office to finance the model/innovation	Higher cost for the PCP/office, but costs primarily assumed up front and lessened over time	Highest cost for the PCP/office, and costs are relatively high over time even with initial investment
	Practice	**Neighborhood**	
Neighborhood or Practice Participation	The model/innovation is largely self-contained within the primary care practice/office and patient-centered medical home	The model/innovation requires participation and involvement, as well as ongoing relationships between the PCP/office and other members of the medical neighborhood	

Appendix B: Resources

Specialty care-primary care integration resources

Intervention	Resources
Enhancing comprehensiveness through colocation of additional services into primary care	
Specialty Services within primary care	Commonwealth Fund Colocating Health Services Brief http://www.commonwealthfund.org/usr_doc/Ginsburg_Colocation_Issue_Brief.pdf?section=4039 HRSA Affiliation Agreements for Rural and Community Health Centers - http://www.bphc.hrsa.gov/policiesregulations/policies/pin199727.html
Hospital-CHC partnerships	
Enhancing comprehensiveness through capacity building of primary care providers	
Specialty trained NP/PA staffing models	
Increasing PCP capacity through training and electronic consultations	UCSF-SFGH eReferral Implementation Handbook - http://www.ciaqsf.org/pdf/eReferral%20Implementation%20Handbook.pdf Ten Steps to Establishing an e-Consultation Service to Improve Access to Specialist Care Liddy et al. Telemed J E Health. 2013 Dec;19(12):982-90. doi: 10.1089/tmj.2013.0056. Epub 2013 Sep 27. http://www.ncbi.nlm.nih.gov/pubmed/24073898 American Association of Primary Care Endoscopy http://www.aapce.org/ American Society for Gastrointestinal Endoscopy Resources - http://www.asge.org/assets/0/71542/71544/28549c5c-8b0e-4050-a588-11791c75ceb2.pdf eyeBook: A Diabetic Retinopathy Book for Primary Care Providers https://itunes.apple.com/us/book/eyebook/id577263837?mt=11 Project ECHO Orientations and Resources - http://echo.unm.edu/ http://echo.unm.edu/orientation.html
Enhancing coordination through defining and developing a network of service providers	
Building formal partnerships in a network	
Integrated systems	

Intervention	Resources
Enhancing coordination through improving patient navigation and engagement	
Improving access to specialty care through use of care coordinators	Key Considerations in Designing a Patient Navigation Program for Colorectal Cancer Screening http://m.hpp.sagepub.com/content/early/2013/12/19/1524839913513587.full Resource Guide for Patient Navigation http://www.fccc.edu/docs/prevention/hchd/navigation-resource-guide.pdf Macoll Institute Referral Coordinator Role Description - http://www.improvingchroniccare.org/downloads/4_referral_coordinator_job_description.pdf
Enhancing coordination through improving communication and collaboration	
Increasing the availability and coordination of specialty care through telemedicine	Telehealth in Community Clinics, California Healthcare Foundation - http://www.chcf.org/~/media/MEDIA%20LIBRARY%20Files/PDF/T/PDF%20TelehealthClinicCaseStudies.pdf Telehealth Resource Centers Program Development Guides - http://www.telehealthresourcecenter.org/program-development California Telemedicine and eHealth Resource Center Telemedicine Resource Handbook - http://www.caltrc.org/wp-content/uploads/2013/10/reimbursement_guide_rev._2011_0.pdf
Across Section Resources	
	Safety Net Medical Home Initiative Care Coordination Implementation Resources http://www.safetynetmedicalhome.org/sites/default/files/Implementation-Guide-Care-Coordination.pdf http://www.safetynetmedicalhome.org/change-concepts/care-coordination

Oral health-primary care integration resources

Intervention	Resources
Enhancing comprehensiveness through colocation of additional services into primary care	
Dental services on site	California Healthcare Foundation Report- http://www.chcf.org/publications/2008/08/expanding-access-to-dental-care-through-californias-community-health-centers
School-based dental services	National Network of Oral Health Access Resources - http://www.nnoha.org/
Academic-CHC partnerships	National Network of Oral Health Access Resources - http://www.nnoha.org/
Enhancing comprehensiveness through capacity building of primary care providers	
Training PCPs and non-dental professionals	California Healthcare Foundation Report- http://www.chcf.org/publications/2008/08/expanding-access-to-dental-care-through-californias-community-health-centers Safety Net medical home lecture series - http://www.safetynetmedicalhome.org/sites/default/files/Webinar-Integrating-Oral-Health-and-Primary-Care.pdf
Enhancing coordination through defining and developing a network of service providers	
Community partnerships	Institute of Medicine Report - http://www.iom.edu/Reports/2011/Improving-Access-to-Oral-Health-Care-for-Vulnerable-and-Underserved-Populations.aspx?utm_medium=etmail&utm_source=Institute%20of%20Medicine&utm_campaign=07.13.11+Report+-+Improving+Access+to+Oral+Health+Care+for+Vulnerable+and+Underserved+Populations&utm_content=New%20Reports&utm_term=Non-profit
Enhancing coordination through improving patient navigation and engagement	
Mobile dental services	National Network of Oral Health Access Resources - http://www.nnoha.org/ http://www.nnoha.org/nnoha-content/uploads/2013/08/Adding-Restorative-Care-to-Health-Center-Mobile-Dental-Programs.pdf
Patient education	
Enhancing coordination through improving communication and collaboration	
Virtual dental homes	Virtual Dental Homes - http://dental.pacific.edu/Community_Involvement/Pacific_Center_for_Special_Care_(PCSC)/Innovations_Center/Virtual_Dental_Home_Demonstration_Project/About_Virtual_Dental_Home.html
Teledentistry	Oral Health IT Toolbox, HRSA - http://www.hrsa.gov/healthit/toolbox/oralhealthittoolbox/index.html

Diagnostic imaging-primary care integration resources

Intervention	Resources
Enhancing comprehensiveness through colocation of additional services into primary care	
In-house imaging	Diagnostic Imaging in the Community: A Manual for Clinics and Small Hospitals, 2011. http://www.paho.org/hq/index.php?option=com_docman&task=doc_view&gid=14116&Itemid=
Enhancing coordination through defining and developing a network of service providers	
Private facility discounts	
Integration with hospitals	Resources and Partnership Development Toolkit http://www.cdc.gov/cancer/nbccedp/toolkit.htm
Access to a public hospital	National Breast and Cervical Cancer Early Detection Program (NBCCEDP) http://www.cdc.gov/cancer/nbccedp/
Enhancing coordination through improving patient navigation and engagement	
Referral coordination	
Enhancing coordination through improving communication and collaboration	
Referral guidelines	

Pharmacy-primary care integration resources

Intervention	Resources
Enhancing comprehensiveness through colocation of additional services into primary care	
In-clinic 340B pharmacy	A primer on 340B pricing program for health centers: https://nachc.com/client/documents/5.11%20340%20Manual%20Primer%20for%20Health%20Centers2.pdf Tools to start an in-clinic pharmacy or a contractual relationship with a commercial pharmacy and details about one health center's decision: http://nyshealthfoundation.org/uploads/resources/pharmacy-services-community-health-center-case-study-march-2012.pdf
In-clinic medication therapy management	Clinical, marketing, and tools for creating an MTM program from American Pharmacists' Association: http://www.pharmacist.com/mtm_library, including a "how to" guide for practice implementation: http://www.pharmacist.com/sites/default/files/files/mtm_creating_patient_care_process.pdf How MTM is being integrated into pharmacy school curricula: http://www.aacp.org/resources/education/Documents/MTMCurriculaCallForSuccessfulPracticesFullSubmissionReport12-11.pdf
Enhancing coordination through defining and developing a network of service providers	
Pharmacist networks	
Enhancing coordination through improving patient navigation and engagement	
Patient assistance program enrollment navigators	Needy Meds has compiled a website to help find patient assistance programs across drug manufacturers: http://www.needymeds.org/indices/pap.htm Volunteers in HealthCare has put together a primer about how to use pharmaceutical assistance programs: https://s3.amazonaws.com/www.rxassist.org/docs/using-pap-programs-manual.pdf
Enhancing coordination through improving communication and collaboration	
Pharmacy-based medication therapy management	Information about billing for MTM in a pharmacy setting: http://www.pharmacist.com/getting-your-mtm-business-started A description of the Asheville Project can be found at http://theashevilleproject.net/home
Prescription fill information shared with PCP	

Intervention	Resources
Provision of medication organization services by pharmacy	

Hospital-primary care integration resources

Intervention	Resources
Enhancing comprehensiveness through colocation of additional services into primary care	
PCP in the inpatient setting	
Enhance communication and collaboration	
Direct communication between PCPs & hospitalists	
Electronic exchange of information between hospitals and primary care	Elements of discharge summary: http://www.uptodate.com/contents/hospital-discharge
Coordination of care using a hospital-based nurse	Project RED: After Hospital Care Plan (AHCP) Template (English and Spanish versions) https://www.bu.edu/fammed/projectred/toolkit.html The Care Transitions Program: Tools for Health Professionals (Including a discharge preparation checklist and patient activation assessment) http://www.caretransitions.org/provider_tools.asp
Coordination of care using a primary care-based nurse	Video- Partners Healthcare "Patient Centered Medical Home: Role of the Care Manager" http://www.partners.org/Innovation-And-Leadership/Population-Health-Management/Stories/Role-Care-Coordinator.aspx Video- WellSPACE Health Interim Care Program (ICP) http://www.wellspacehealth.org/interim_care.htm
Post-discharge access to primary care medical home	
Across Section Resources	
	Reducing Care fragmentation: A Toolkit for Coordinating Care http://www.improvingchroniccare.org/downloads/reducing_care_fragmentation.pdf
	The Post-Hospital Follow-Up Visit: A Physician Checklist to Reduce Readmissions http://www.chcf.org/~/media/MEDIA%20LIBRARY%20Files/PDF/P/PDF%20PostHospitalFollowUpVisit.pdf
	IHI How-to Guide: Improving Transitions from the Hospital to the Clinical Office Practice to Reduce Avoidable Rehospitalizations http://www.ihi.org/knowledge/Pages/Tools/HowtoGuideImprovingTransitionsHospitaltoOfficePracticeReduceRehospitalizations.aspx
	Webinar- Redesign of the Hospital Discharge: Patient-Centered Care to Improve Safety, Cost and Outcomes https://snmhi.adobeconnect.com/_a943653710/p6s9pudxu11/?launcher=false&fcsContent=true&pbMode=normal


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