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Key Ingredients for Implementing Intensive Outpatient Programs within Patient-Centered Medical Homes: A Literature Review and Qualitative Analysis

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Abstract

Background: Intensive outpatient programs aim to transform care while conserving resources for high-need, high-cost patients, but little is known about factors that influence their implementation within patient-centered medical homes (PCMHs).

Methods: In this mixed-methods study, we reviewed the literature to identify factors affecting intensive outpatient program implementation, then used semi-structured interviews to determine how these factors influenced the implementation of an intensive outpatient program within the Veterans Affairs' (VA) PCMH. Interviewees included facility leadership and clinical staff who were involved in a pilot Intensive Management Patient Aligned Care Team (ImPACT) intervention for high-need, high-cost VA PCMH patents. We classified implementation factors in the literature review and qualitative analysis using the Consolidated Framework for Implementation Research (CFIR).

Results: The literature review (n=9 studies) and analyses of interviews (n=15) revealed key implementation factors in three CFIR domains. First, the *Inner Setting* (i.e., the organizational and PCMH environment), mostly enabled implementation through a culture of innovation, good networks and communication, and positive tension for change. Second, *Characteristics of Individuals*, including creativity, flexibility, and interpersonal skills, allowed program staff to augment existing PCMH services. Finally, certain *Intervention Characteristics* (e.g., adaptability) enabled implementation, while others (e.g., complexity) generated implementation barriers.

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Conclusions: Resources and structural features common to PCMHs can facilitate implementation of intensive outpatient programs, but program success is also dependent on staff creativity and flexibility, and intervention adaptations to meet patient and organizational needs.

Implications: Established PCMHs likely provide resources and environments that permit accelerated implementation of intensive outpatient programs.

Level of Evidence: V

Keywords

intensive outpatient program; patient-centered medical home; veteran; implementation

Introduction

Health care systems continuously struggle to improve patient care while wisely deploying limited resources. Some approach this challenge through intensive outpatient programs designed specifically for the minority of high-need, high-cost patients who account for disproportionate costs [1, 2]. These innovative programs, which provide patients with frequent contact, self-management support, and social services, can improve patient outcomes, although findings regarding utilization and cost benefits are mixed [3–8].

Intensive outpatient programs are of special interest within patient-centered medical homes (PCMHs), which often focus on patients with chronic illnesses. PCMHs provide patients with personalized primary care intended to treat the “whole person,” coordinating care across specialties with a focus on safety, quality improvement, and open access [9]. Some studies suggest that PCMHs decrease Medicare costs, total acute care costs, and emergency room visits [10]. Other studies find no associations between PCMHs and costs/service use [11], or suggest that PCMHs are poorly suited for small practices [12]. However, even when overall PCMH effects are minimal, analyses focusing on patients with chronic illness suggest that there may be decreases in costs/service use among higher-risk patients [13, 14, 10]. Therefore, augmenting PCMHs with targeted interventions for high-need, high-cost patients may improve their value.

Despite the shared focus on chronic illness and potential for synergy, little research describes implementing intensive outpatient programs within PCMHs. In this paper, we review literature describing the implementation of intensive outpatient programs to identify implementation factors relevant in PCMH settings. We augment this review with a qualitative implementation evaluation of a program designed to augment the well-established PCMH in the Veteran Affairs Health Care System (VA) [2, 15, 16].

Materials and Methods

Literature Review.

Our literature review is based on an evidence synthesis conducted by VA’s Evidence-Based Synthesis Program Coordinating Center [15] to inform VA’s intensive outpatient program development. The synthesis used the MeSH terms: “comorbidity”; “frail elderly”; “patient care management” “patient care team”, “home care services”, “hospitalizations”; and

"patient readmission," and was later supplemented with additional peer-reviewed and gray literature to guide design of the ImPACT intervention [2].

For the present study, two authors reviewed the ten articles previously identified as providing implementation information [2] to: 1) describe factors affecting the implementation of intensive outpatient programs and 2) identify factors that may be important within PCMHs. Of ten articles reviewed [3, 17–25], all but one [25] provided information on implementation factors; therefore, nine articles were included. We categorized implementation factors using the Consolidated Framework for Implementation Research (CFIR; [26]). CFIR delineates five domains (*Intervention Characteristics, Outer Setting, Inner Setting, Characteristics of Individuals* involved in implementation, and the *Process* of implementation) that influence the implementation of complex interventions.

Setting for the Qualitative Implementation Evaluation

Patient Aligned Care Teams (PACT).—PACT, VA's PCMH, launched in 2010. PACT has been implemented at 152 VA medical centers and ~800 clinics, making it one of the nation's largest PCMH systems. PACT provides each VA primary care patient with a "medical home" consisting of a physician, a nurse, a medical assistant, and administrative staff [16].

Intensive Management Patient Aligned Care Team (ImPACT).—In 2012, health services researchers, facility leadership, and clinicians partnered to develop and evaluate ImPACT, a single site novel intensive outpatient program for high-need, high-cost patients. ImPACT began enrolling patients in February 2013 and has been described previously [2].

High-need, high-cost patients.—Patients were eligible (and randomly selected) for ImPACT services if: 1) their one-year risk for hospitalization was in the top 5% (based on an established VA risk score [27]) or if their total VA care costs was in the top 5% during fiscal year 2012, 2) they were not enrolled in another VA intensive program such as home-based primary care, and 3) they were outpatients for at least half of a 9-month eligibility period.

ImPACT intervention.—The ImPACT team consists of a nurse practitioner; physician; recreation therapist; and clinical social worker; all collocated within PACT. Key elements of the program include comprehensive intake assessments, care coordination (e.g., ImPACT clinicians co-attend visits with specialists), and patient-centered goal setting. Patients have 24-hour telephone access to ImPACT clinicians. The team has weekly huddles and an electronic tracking system that alerts them when a patient is hospitalized or seen in the emergency department, facilitating coordination with inpatient services, discharge planning, and rapid follow-up after health status changes.

Qualitative Methods.

We used purposeful sampling [28] to identify individuals who were actively involved in the development/implementation of ImPACT and its integration with PACT. From November-December 2013, one researcher conducted 15 qualitative interviews with all ImPACT clinicians, members of facility leadership (three physicians), and eight other clinicians who

interacted with ImPACT (a hospitalist and three primary care physicians, one nurse practitioner, and three nurses from PACT). Participants were provided with a $10 VA canteen voucher.

Interview methodology.—After obtaining informed consent, interviews were conducted using a semi-structured guide based on the literature review and CFIR, with different questions for ImPACT clinicians, facility leadership, and other clinicians. Interviews with ImPACT clinicians lasted ~1 hour, interviews with facility leadership/other clinicians lasted 15-30 minutes.

Coding.—All interviews were digitally recorded and transcribed verbatim. Two authors used deductive coding to complete provisional coding [28] of transcripts using the five CFIR domains and Atlas.ti version 7, coding all instances of any domain and consulting a third author in the event of disagreement. Next, all three authors reviewed coded quotes separately and together to sort them into 33 CFIR subdomains. An inductive clustering procedure [28] in which transcripts were sorted into other possible themes (e.g., staff dynamics) confirmed that CFIR domains provided the best data categorization. All methods were approved by a university Institutional Review Board.

Results

Literature Review.

Table 1 describes characteristics of intensive outpatient programs discussed in review articles [3, 17–24], including program size, setting, and recruitment strategy. While none of the articles described implementation within PCMHs, half of the models were implemented in integrated care settings and two papers described programs implemented in settings similar to PCMHs (e.g., chronic care models) [18, 19].

Table 2 presents implementation factors reported by reviewed articles, which predominantly relate to three CFIR domains. First, the *Inner Setting*, which refers to environmental implementation factors, including networks and communication among staff, access to knowledge about the intervention, and the cultural/structural characteristics of the site (e.g., a shared mission between intensive outpatient program and PCMH staff). Second, *Characteristics of Individuals,* which describe staff characteristics and beliefs about the intervention (e.g., the importance of interpersonal skills and clinical expertise in treating complex patients). Finally, the studies described *Intervention Characteristics*, including adaptability of the intervention and/or complexity of patient populations.

Qualitative Interviews.

Implementation of ImPACT was influenced by many of the same CFIR domains identified in the literature review, including: *Inner Setting*; *Characteristics of Individuals*; and *Intervention Characteristics.* Table 2 presents these themes in relation to literature review findings. Additional quotes are provided in Table 3.

Inner Setting.—ImPACT clinicians, other clinicians, and facility leadership considered the *Inner Setting* important, particularly at the beginning of the implementation process.

Interviewees expressed a strong sense of what CFIR terms "*tension for change*," which refers to beliefs that the current situation needs change. In the case of ImPACT, this manifested as a belief that high-need patients in PACT were at risk for "falling through the cracks." This tension for change motivated other clinicians to participate in and promote ImPACT as a way to improve patient care. As one clinician said,

> "I don't get an opportunity to call every patient or track every patient, so it's nice that somebody is calling those patients that are high-end users…"

All three groups also reported that the VA facility's *culture* of "innovation*"* eased implementation because ImPACT, which provides personalized care, fit with VA's current emphasis on patient-centered care. In addition, several participants cited the importance of VA's *structural characteristics* to facilitating implementation, noting that many of ImPACT's innovations (e.g., templates, identification of patients) relied on existing VA systems (e.g., PACT, the electronic health record).

Elements of the facility's *structure* were also barriers to implementation. Interviewees described how resource limitations complicated collaboration across settings and most ImPACT clinicians felt that an initial lack of collocation with PACT clinics posed care coordination challenges. In addition, as one ImPACT clinician noted, "[ImPACT is] very counter to the structure of how most care is delivered here…[where] things are very compartmentalized." For example, mental health care typically took place on a separate campus from primary care clinics. This posed a challenge to providing integrated care to ImPACT patients with mental health needs.

All parties described *networks and communication* as critical to implementation. Existing communication channels, like regular PACT meetings and secure communication technology, offered PACT providers *access to information* about ImPACT. Despite communications about the program, however, early during implementation there was some confusion about roles and responsibilities. For example, several PACT clinicians found it difficult to identify ImPACT patients and, despite ImPACT clinicians' presence at staff meetings, some PACT clinicians were unaware of the program until approached by ImPACT clinicians to discuss specific patients. Communication was also difficult with rotating hospital staff (e.g., residents) and it was not immediately clear whether ImPACT or PACT would be responsible for tasks like medication management. The latter was complicated by different preferences among different clinicians and the fact that some clinicians were not interested in collaborating with ImPACT.

Communication challenges appeared to diminish with time, an improvement attributed to program collocation and in-person encounters with ImPACT staff. Other clinicians also appreciated that ImPACT clinicians "appropriately triaged" updates and alerts and did not increase PACT's workload with unnecessary communication. ImPACT clinicians noted the importance of reciprocal communication between PACT and ImPACT, for example, they added "a quote about ImPACT and a phone number" to all clinical notes in response to feedback from PACT clinicians.

Finally, *facility leadership engagement* was cited as critical, especially during ImPACT's early stages when facility leaders attended weekly meetings with the ImPACT team. The meetings leveraged the expertise of all representatives, with meeting agendas set by ImPACT clinicians, who thought leadership involvement was "perfect" and provided flexible guidance that allowed for creative freedom. This mutual respect allowed the group to solve problems (e.g., finding additional office space) and adjust the intervention (e.g., increased social work hours) in an "agile" manner.

Characteristics of Individuals.—ImPACT clinicians' *individual characteristics* were widely acknowledged as critical to the program's implementation success. PACT clinicians lauded the flexibility that ImPACT clinicians brought to problem-solving care for complex patients. As one said, ImPACT provides

> "More creative ideas to help, more heads to try to figure out what to do with these patients that keep coming back to the ER."

Both ImPACT clinicians and leadership noted the importance of ImPACT clinicians' proactive approach to care. Similarly, ImPACT clinicians described needing to "step up to the plate" and prove the utility of ImPACT. As a member of facility leadership noted, ImPACT clinicians had to have "people skills" and the "internal respect of colleagues" to engage PACT clinicians.

ImPACT clinicians highlighted additional characteristics, including the importance of "a cohesive team of very skilled individuals." ImPACT clinicians also developed methods, such as a patient tracker, to-do lists, and shared calendars that were integral to implementation. Some noted the importance of specific team members' disciplines – "you need MD at end of the name for some things." Others described the necessity of playing multiple roles, for example, in addition to providing recreation therapy, the recreation therapist at times functioned as a scheduler and/or a liaison to community programs.

Positive beliefs about the intervention represent another important implementation factor. The novelty of ImPACT initially complicated buy-in from PACT clinicians, perhaps because, as the team suggested, other clinicians first saw the program as a "burden." However, many PACT clinicians reported that ImPACT reduced clinician burden. Others appreciated learning about ImPACT's non-traditional services, which increased positive beliefs about the intervention. As a result of these positive beliefs, many wanted to ensure the success and future implementation of ImPACT. This enthusiasm led facility leadership to open the program to referrals after the pilot ended.

Intervention Characteristics.

Facility leadership described explicitly designing ImPACT as an *adaptive* program to ensure that it could be implemented outside research settings and that, if effective, clinicians would "view [ImPACT] as something that was going to be helpful…that they would want to participate [in] and refer their patients to…" In practice, *adaptability* allowed ImPACT clinicians to tailor the program to PACT clinicians' preferences. This feature may have also helped PACT clinicians acclimate to ImPACT's care model, as one said, "[ImPACT clinicians] jumped in and I could ask them for support so it seemed like a resource."

The adaptability of ImPACT's design also enabled ImPACT clinicians to change the intervention to fit unanticipated demands (e.g., developing protocols for outside opioid prescriptions). These iterative program improvements helped address the complex needs of ImPACT patients. As one ImPACT clinician said when discussing lessons learned:

> "[ImPACT], at its core, is trying to address 100 or 200 patients' individual needs and goals; so there is no one answer and so flexibility is important."

At the same time, ImPACT's novelty as a program for veterans generated challenges during implementation. For example, trainings based on programs at other institutions were considered helpful, but ImPACT clinicians "didn't walk away [from trainings] saying, oh I know how to do this," which they attributed to the fact that trainings were based on non-VA programs that did not always address veterans' unique needs and circumstances. Ambiguity about ImPACT's relationship to PACT care, which leadership stated was intentionally "left a little bit open" to allow for adaptation as the program evolved, also contributed to uncertainty about roles and responsibilities.

Other *Intervention Characteristics* that complicated implementation related to the program's status as a pilot, including a *lack of administrative staff,* a *short timeline,* and uncertainty about sustainability. As one ImPACT clinician noted, "it is hard for a team to work under these conditions [when] what they're spending all their time on may disappear…"

Discussion

This review and qualitative study of the implementation of intensive outpatient programs within PCMH settings suggests that structural, organizational, and communication factors at the core of many PCMHs are likely to facilitate the implementation of intensive outpatient programs for high-need, high-cost patients. In-depth interviews of leadership and clinicians involved in the VA's first intensive outpatient program suggest that elements unique to the VA system and its PCMH, delivered by PACT teams, may have mitigated some implementation barriers found in more fragmented settings.

Across settings, the most commonly cited implementation factors were related to three CFIR domains. The *Inner Setting*, including networks and communication, a culture of innovation, and tension for change. *Characteristics of Individual* clinicians, namely their clinical and interpersonal expertise. Finally, *Intervention Characteristics*, such as the intervention's adaptability and focus on complex patients. The consistent importance of these factors suggests that many implementation factors are related to the quality of existing improvement structures as opposed to specific care models.

The CFIR domain most tightly linked to implementation was the *Inner Setting*, which encompasses several benefits of PCMHs, including care coordination and quality improvement. Both the literature review [4, 6, 20, 18, 19, 21, 3, 17, 23, 29] and qualitative analysis highlighted its importance, particularly at the beginning of the implementation process. However, ImPACT interviewees did not describe several implementation barriers discussed in prior work [6, 29], including difficulty with crisis management, phone contacts, and health information technology. It is likely that innovative structural characteristics of

VA, including PACT, prevented many of these barriers. For example, ImPACT used PACT's existing crisis management and telephone care protocols. Similarly, VA has used an electronic medical record since 1996 [30], which facilitated communication between ImPACT and PACT.

The importance of *Characteristics of Individuals* also holds across settings. Prior work [4, 6, 29, 19, 21, 3, 17, 23, 20, 18] and our qualitative analysis suggest that successful intensive outpatient program implementation relies on careful and deliberate hiring practices that identify and retain staff who are creative and flexible because high-need, high-cost patients often have multiple mental and physical health problems, and there are few, if any, evidence-based protocols or guidelines for this population. Consequently, staff must also have excellent interpersonal skills in order to persuade other clinicians to follow them into potentially uncharted clinical territory.

Important *Intervention Characteristics* included adaptability in program design, the need for ongoing learning, and a sufficient evaluation timeline. The consistency between the literature review [4, 6, 29, 20, 18, 19, 21, 3, 17, 23] and qualitative findings highlight how these factors interact to affect implementation (e.g., applying knowledge gained through ongoing learning requires an adaptable program design). ImPACT staff continually stressed the importance of adapting ImPACT to meet needs identified through discussions with PACT clinicians, noting that it takes time to translate these interactions into specific program components. Therefore, results support suggestions for lengthy timelines when evaluating outcomes (e.g., 18-24 months) [6].

As with all qualitative work, findings may not generalize to other settings. For example, local PACT and VA features, such as health information technology that facilitated ImPACT's implementation, particularly with regard to communication, may hinder implementation in more fragmented systems. Nonetheless, this report offers important information on the individual, intervention, and organizational factors that are critical to the success of intensive outpatient programs within PCMHs. Our findings may also provide guidance for implementing intensive outpatient programs in non-integrated health care systems, as they speak to the importance of communication systems, collocation, and infrastructure that may need to be developed in such settings (at great potential cost).

Conclusions.

Organizational and communication features central to PCMHs can facilitate the implementation of intensive outpatient programs for high-need, high-cost patients, but program success is also highly dependent on staff creativity and flexibility, and the feasibility of intervention adaptations to meet the needs of patients and organizations. Future research should continue to investigate and codify characteristics of effective intensive management staff and programs in different settings, and examine association between these characteristics and patient outcomes.

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Table 1

Details of intensive outpatient programs in the literature review and qualitative interviews

Program or Author Name	Population Characteristics	Recruitment Method	Care Team	Program Length	Setting	Sample and/or Panel Size	Geographic Region
Special Care Center [3]	• Low wage • Immigrant • Non-White (83%) • Non-English speaking (58%) • Multiple chronic conditions	NS	• 2 full time physicians • 2 nurse practitioners • 7 health coaches • 1 admin. director/ licensed social worker • 2 client services reps • 1 part time nutritionist • 1 consulting psychiatrist	NS	Integrated health care system	Sample: 1000+ patients per year Panel: Each health coach managed 80-150 patients	Atlantic City, New Jersey
Raven et al. [17]	• Active substance abusers (95%) • Homeless (89%) • White (47%) • Hispanic (32%) • Multiple chronic conditions	Algorithm used to identify eligible patients admitted 24 hours prior, all eligible patients approached for enrollment while in hospital	• Case manager • Project director • MSW • Physician	NS	Public hospital	Sample: 19 Panel: NS	New York City, NY
King County Care Partners [18]	• Non-White (45%) • Multiple chronic conditions	Clinical team given a list, one team member contacted patients	• 3 RNs • 2 MSWs with chemical dependency training • A bachelor's level individual trained in chemical dependency counseling	Up to 1 year	Integrated into safety net primary care system; RCT	Sample: 256 Panel: 67-70 clients per RN/ team	King County, Washington

Program or Author Name	Population Characteristics	Recruitment Method	Care Team	Program Length	Setting	Sample and/or Panel Size	Geographic Region
Intermountain Healthcare [19]	NS	Patients referred based on need	• Physician • Medical assistant • Care manager • Office manager	NS	Integrated health care system	Sample: 2,356 Panel: NS	Utah and Idaho
Okin et al. [20]	• Male (87%) • African-American (49%) • Unemployed (67%) • Homeless (67%)	Patients referred by ED staff and screened by case managers	• Case Manager • Psychiatric social worker	1 year	Hospital with high collaboration between case managers and ED, and inpatient and PCP. Social work role was to improve linkage to PCP.	Sample: 174 Panel: NS	San Francisco, CA
Medicare Coordination Care Demonstration [21] (represents 11 programs)	• Medicare beneficiaries: lived within program's catchment area • Covered by fee for service Medicare with primary Part A and B coverage • Had one or more of the program's target chronic conditions (varied by program)	Patients voluntarily enrolled in programs at any point during the five years after its 2002 start date	• Common feature includes RNs as care coordinators	NS	Community hospitals, academic medical center, integrated delivery system, hospice, and long-term care facility	Sample: 22,000 Panel: NS	Across the United States

Program or Author Name	Population Characteristics	Recruitment Method	Care Team	Program Length	Setting	Sample and/or Panel Size	Geographic Region
Primary Intensive Care [22]	• White (82%) • Covered by Medicaid or Medicare • Multiple chronic conditions	Patients referred by PCP or inpatient care coordinator	• Internist • Psychiatrist-internist • Nurse practitioner • Pharmacist • Social worker	5-12 months	Hospital	Sample: 20 Panel: NS	NS
Rethinking Care [23]	• White (57%) • Serious mental illness (49%)	Patients identified as being in the top 20% of clients at risk for high healthcare costs were contacted by research team	• Nurse care managers • Social worker • Physician • Clinical care coordinator	up to 2-years	Community health centers; RCT	Sample: 690 Panel: NS	Washington
Shumway et al. [24]	• Non-White (87%) • multiple chronic conditions	Patients identified through medical records, eligibility determined through interviews, case manager supervisor conducted final evaluation	• MSW • Nurse practitioner • PCP • Psychiatrist	2-year	Hospital; RCT	Sample: 167 Panel: NS	San Francisco, CA
Intensive Management Patient-Aligned Care Team (ImPACT) [2]	• White (79%) • Multiple chronic conditions	Algorithm identified high-need, high-risk patients; Study team contacted eligible patients via phone, mail, and/or at appointments	• RN • MSW • RT • Physician	NS	Integrated health care system; RCT	Sample: 150 Panel: 150	Palo Alto, CA

Admin: Administrative; ED: Emergency department; MSW: Social Worker; NS: Not specified; PCP: Primary care physician; RCT: Randomized controlled trial; Reps: Representatives; RN: Registered Nurse; RT: Recreation Therapist

Note: Dorr and colleagues [19] provide additional information on Intermountain Healthcare [31]. Lessler and colleagues [18] provide additional information on King County Care Partners.[23] Okin and colleagues[20] provide additional information on the program described by Shumway and colleagues [24].

Table 2

Factors influencing the implementation of intensive outpatient programs within patient-centered medical homes

CFIR domain	Implementation factors identified in literature review	Implementation factors identified in qualitative analysis
Inner Setting		
Implementation Climate & Culture	- Defining the roles for new models of care (e.g., who will provide health coaching) [3, 19] - Proper pay scale for care managers/coaches given that they are often classified as medical assistants, but require more skills/pay [3] *	- Tension for change - Culture of innovation
Structural Characteristics	- Availability and effectiveness of health information technology [18, 17, 3, 19] - Healthcare system financing structure (e.g., capitated) [3] *	- Established health information technology and existing PCMH
Networks & Communication	- Communication, coordination, and collaboration within and between intensive outpatient team, other clinicians, and patients [23, 17, 3, 18, 21] - Information overload and inefficient patient management, including multiple clinicians managing the same issue [19]	- Collocation of intensive outpatient team and PCMH, proximity to key specialists (e.g., mental health care) - Access to information about the intervention - Clarity of roles and responsibilities
Leadership Engagement	- Level of leadership support [18, 3, 19]	- Leadership engagement
Characteristics of Individuals		
Knowledge and Beliefs about the intervention & Other personal attributes	- Clinicians' medical, cultural, language, problem-solving, and interpersonal skills, especially with complex patients [23, 3] - Managing psychological strain of treating complex patients [22, 18, 17] * - Non-intensive management clinicians' interest in new approaches to care [3, 19, 18] - Staff perseverance and proactive approach to care [20] - Willingness to provide non-traditional care in the absence of evidence about efficacy [3, 21, 19]	- Positive beliefs about the intervention and intervention staff, including staff's clinical and interpersonal expertise - Team cohesion - Proactive approach to care
Intervention Characteristics		
Adaptability	- Flexibility of follow-up timeline [18] - Flexibility of care plan procedures (no single approach for all patients) [21, 19, 17] - Degree to which health coaches are encouraged to employ unique strengths [3] - Degree to which teams can grow and change to meet patients' needs [19]	- Feasibility of adapting intervention to meet the needs of patients and PCMH clinicians
Complexity	- Flexible team boundaries when providing care [18, 20, 21] - Staff retention [18]	- Multidimensional roles of staff

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CFIR domain	Implementation factors identified in literature review	Implementation factors identified in qualitative analysis
	- Patient-clinician ratio [17, 3] - Presence of mental health and pharmacy clinicians [23, 3, 21] - Availability, relevance, and quality of training [3, 22, 19, 18]	- Shortage of relevant training for novel intervention
Cost	- Intervention costs [3, 17]	- Limited staff and insecure employment
Outer Setting		
External networks	- Shared mission and trust* among all outside partners, including clinician buy-in [18, 22, 21] - Integration and collaboration with community resources [18, 20, 19] - Partners access to health information technology [19]* - Community partners' approach to patients with multiple conditions [20]*	- Connection to community programs through recreation therapy
Process		
Reflecting and evaluating	- Clinician referrals [19] - Length of follow-up periods and the ability to see changes within that period [23] - Finding cost data from outside systems [17, 24]* - Detailed mental health assessments to track changes in mental health [24]* - Time between participants expressing interest and intake assessments [23]* - Staff availability in patient recruitment [24]*	- Importance of involving staff from the beginning of the development process - Time pressure to show results

*Not mentioned by ImPACT staff

CFIR: Consolidated Framework for Implementation Research [23]; PCMH: Patient-centered medical home

Note: Dorr and colleagues [19] provide additional information on Intermountain Healthcare. [31] Lessler and colleagues[18] provide additional information on King County Care Partners. [23] Okin and colleagues [20] provide additional information on the program described by Shumway and colleagues. [24]

Table 3

Additional interview quotes describing factors influencing the implementation of an intensive outpatient program within the VA's patient-centered medical home

CFIR Domain	Quote
Inner Setting	
Implementation Climate & Culture	… this is an enterprise that values innovation…[the director of the hospital] is very engaged with innovation…and is always looking at novel promotions for this facility. (Leadership)
	… we are being pushed to see patients less frequently in [the General Medicine Clinic] and, you know, we are sort of at this conundrum of, okay, let's push this patient out as far as we can, you know, see them only every six months, nine months, a year. And, you know, I think patients fall through the cracks. (Other Clinician)
	I think one of the biggest things that we learned that we needed to do with [ImPACT] is the ability to provide an intervention quickly. And in order to do that you have to have support. And what I think…[the nurse practitioner] interfaced with at the beginning [was]…an understaffed PACT, you can't intervene quickly when there's just not the resources there to do it." (ImPACT Team)
Structural Characteristics	I don't think we could have done [ImPACT] except at the VA… because the VA had PACT care already. We didn't have to invest in it, take care of it. They already had so many established professionals and expectations of professionals, you know integrated teams, social workers, nurses, physicians, working together—administrators. So that kind of culture could have taken years to develop. (Leadership)
	I think it does fit [VA Palo Alto's culture] but it's a silo to a certain extent… and VA is really good about having silo programs and how do we really assure that flow, a seamless flow and all that? (Other Clinician)
Networks & Communication	… [The nurse practitioner]'s been totally appropriate about level of acuity, you know in terms of what can be a co-signer [on a note], what can be an email, what, you know—let's call her, let's page. You know sometimes she just finds me and that works well. And it's been medically appropriate so she's not finding me for some refill that could have waited. I mean it's all appropriate triage and if she is grabbing me it's because something is up you know. (PACT Clinician)
	[a patient] was on our service and [I] had no idea that they were an ImPACT patient. And I remember someone called me up and told me about some extra information about the patient that was helpful but I didn't have any idea who this person [who called me] was… (Other Clinician)
Characteristics of Individuals	
Knowledge and Beliefs about the intervention & Other personal attributes	[ImPACT offers] more and more creative ideas to help, more heads to try to figure out what to do with these patients that keep coming back to the ER that necessarily don't adhere to the treatment, and so [ImPACT] gives me other ideas. (Other Clinician)
	Well, like I said, and again, the people have been just amazing on this ImPACT team. I just feel like they are a great resource and they are very responsive and creative ideas and very flexible. (Other Clinician)
	I think [ImPACT gives] just sort of relief of having someone also worrying about [my patients] and not me having to call them and realizing that they are sort of taken care of. I don't need to worry about them as much. (Other clinician)
	I'm used to this just being a mid-level provider: you are either really well-received or you've got to step up to the plate and prove your worth. (ImPACT Team)
Intervention Characteristics	
Adaptability	… the ways that the PACT teams could interact with ImPACT was left a little bit open so [if one way] might not be the way that they prefer to do it…we're also willing to work with them in other ways; either we can work with [the PACT clinician] or we can take over all of the care…giving room for roles to be defined, I think helped with acceptance. (Leadership)
Complexity	We failed to get those patients [with serious mental illness, pain and/or substance use disorders] because we're not specifically geared towards them and they're a whole unique set… And patients don't need to have a computer to interact with ImPACT but you do have to have a phone. (ImPACT team)
Cost	Yeah. It's not all plug and play. We've got—we don't have second stringers who are waiting for a chance to play who are under the control of ImPACT. You know we're essentially beholden to the largesse of people outside [ImPACT] to either provide additional support or do it as a collateral duty. (Leadership)

CFIR Domain	Quote
Outer Setting	
External networks	…our area is rich in resources, hugely rich in resources which makes my job completely easier. I can connect somebody, link someone into a community, free acupuncture, free this, free that for veterans… (ImPACT Team)
Process	
Reflecting and evaluating	When you are talking about the population of the chronically ill, you're talking about people that have these behaviors and these poor self-management skills for 40 to 50 years of their lives and then you ask them to change in six to nine months and you evaluate them off of that small amount of time. I don't think that's fair. (ImPACT Team)

CFIR: Consolidated Framework for Implementation Research; ER: Emergency room; ImPACT: Intensive Management Patient Aligned Care Team; PACT: Patient Aligned Care Teams; VA: Veteran Affairs Health Care System