

**Implementation of Interprofessional Case Conferencing to Address Complex  
Biopsychosocial Needs**

by

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## Abstract

**Problem:** A community assessment of Southwest Baltimore found a population with medical, economic, and social needs. The population needs were directly impacted by its residents' social determinants of health in this community, including homelessness, poverty, unemployment and unmet medical needs. Professional departments within community center work independently without a structured collaborative process or shared documentation despite mutual patients with multiple complex biopsychosocial needs.

**Purpose:** The purpose of the quality improvement project was to implement and evaluate the effectiveness of interprofessional case conferencing.

**Methods:** Department leaders from case management, health and wellness, financial advisement, workforce development, and community outreach were trained on the concepts of the social determinants of health, care coordination, and case conferencing. The evaluation of complex biopsychosocial needs was incorporated into each department's workflows. Patients (neighbors) who were found to require intervention from multiple departments were referred to the case conferencing team. This interprofessional team met weekly to discuss shared neighbors, provide updates, and set goals, all of which was documented on a single shared template accessible to all. Pertinent data were collected and analyzed including: total neighbors referred, number of neighbors discussed at conferences, attendance of professionals at conferences, and number of individual goals met.

**Results:** By the end of the 15-week implementation period, a total of 108 neighbors were referred with 225 needs identified. A total of 89 discussions were had about 34 neighbors. At the conclusion, 12% (n=12) of neighbors met their individual goals and 24% (n=25) were still

actively working with departments. Twenty eight percent (n=29) had been lost to follow-up, and 36% (n=37) were never reached via the contact information provided. By midpoint, there was 100%+ staff attendance at weekly case conferences.

Conclusions: Interprofessional case conferencing is an effective method for interdepartmental collaboration. The method and procedure used in the implementation of this project can be individualized and applied to multiple settings and organizations.

### **Interprofessional Case Conferencing to Address Complex Biopsychosocial Needs**

The health outcomes of Baltimore City's most vulnerable populations are directly impacted by their social determinants of health. A 2017 point in time estimate calculated 2,699 persons (0.4%) in the city to be homeless (Baltimore City Health Department [BCHD], 2017). The unemployment rate is 13.1% and the percentage of those families with children under 18 who live in poverty is 28.8% (BCHD, 2017). Roughly one third of households earn less than \$25,000 per year, of whom are more likely to have unmet medical needs and lack insurance (BCHD, 2017). Local community data suggests the most important medical complications within their target community to be substance abuse disorders, mental health, and chronic disease management, and the most important social or environmental problems to be employment and career opportunities, neighborhood safety and violence prevention, and affordable housing and homelessness (University of Maryland Medical Center, 2021).

The literature shows that patients with complex needs are best managed through interprofessional collaboration, however at the community center there was no shared process between departments prior to project implementation. The process flow map can be found in Appendix A. Despite having shared patients (neighbors), departments were unaware of other professional's status with neighbors, did not always assess for complex interrelated needs, and did not utilize an internal referral system. The purpose of this project was to implement and evaluate the effectiveness of interprofessional case conferencing. Anticipated long term outcomes include improvement in neighbors' functional status, increased rates of housing, better use of community resources, and improved adherence to care plans. Additional anticipated long-term outcomes include reductions in health care costs, hospitalizations, and emergency department use.

### **Evidence Review**

Care coordination, defined by the Agency for Healthcare Research and Quality [AHRQ] as deliberate organization of patient care activities and the sharing of information among all of the participants involved in a patient's care in order to provide more safe and effective care, is the focus of this evidence review (AHRQ, 2018). A total of eight studies were synthesized to draw conclusions and formulate an approach to addressing the community center's lack of interprofessional collaboration (Tables 1 and 2).

When comparing usual care of patients with multiple chronic conditions and complex needs to care involving interprofessional collaboration or care coordination, many positive outcomes were found for patients, teams, and institutions. Various interventions were used in these studies including: interprofessional rounds, interprofessional meetings, role clarification, interprofessional checklists, case conferencing, development of shared care plans, personalized goal setting, and identifying and addressing client needs. Patient outcomes included a reduction in: systolic and diastolic blood pressure, hemoglobin A1c, cholesterol levels, length of hospitalization, smoking, and levels of drug and alcohol abuse (Pascucci et al., 2021; Stergiopoulos et al., 2010; Tricco et al. 2014). Institutional outcomes included significant reductions in hospitalizations, emergency department visits, and hospital costs (Tricco et al., 2014).

Improvements in patients' functional status, adherence to care plans, use of provided resources, self-management, empowerment, Global Assessment of Functioning Scale scores were also found (Pascucci et al., 2021; Stergiopoulos et al., 2010; Tricco et al. 2014). Due to the prevalence of homelessness or housing instability at the center, a study by Sterogiopoulos et al. (2010) was also included in this evidence review. At the beginning of this individual cohort

study, 84% of clients were homeless. After the multidisciplinary outreach intervention, two thirds of them were no longer living on the street or in the shelter. In summary, care coordination improves team involvement, enhances patient centered care, and expands pathways, particularly for patients with chronic conditions or complex biopsychosocial needs.

Three level I studies, all quality B, one level IV study, quality A, two level VI studies, quality B, and one level VII study, quality B were utilized in this synthesis. These level and quality ratings are based on the Johns Hopkins Evidence Based Practice Evidence Rating Scales (Newhouse et al., 2005). A site-specific intervention was developed based on the literature and utilizing the resources readily available at the community center.

### **Theoretical Frameworks**

The concepts of several practice and theoretical frameworks were used to leverage the practice change. The Health Belief Model (Figure 1) has been evolving since the 1950s to explain the failure of people's involvements in programs to prevent and detect disease. This model was chosen as the practice theory for this quality improvement initiative as it addresses several concepts, or individual beliefs, that attribute to people's actions to prevent, screen for, or control illnesses: susceptibility, seriousness, benefits and barriers to a behavior, cues to action, and self-efficacy (Glanz, Rimer, & Lewis, 2008). Together, individuals within the interprofessional team can influence these concepts through the following interventions: addressing individual beliefs to influence action, particularly by reducing both real and perceived barriers; developing patients' strategies to activate readiness; and enhancing confidence in the patients' abilities to take action.

A complement to this practice theory is the multilevel model of the social determinants of health, conceptualized by Dahlgren & Whitehead (Figure 2). This model shows “rainbow-like” layers of influence where the individual retains fixed characteristics such as age and gender, however the social determinants of health (socioeconomic, cultural, and environmental conditions) may be modified through intervention. This model was chosen to demonstrate how each of the departments at the community center plays a unique and specific role in addressing each of these categories. Through interprofessional collaboration, the team can address the “whole patient.”

The Conceptual Framework of Complex Innovation Implementation as described by Helfrich et al. (2007) seen in Figure 3 was used as a guide for the implementation plan. As the community center was in the process of fine-tuning its goals and initiatives, we were in the window of opportunity for incorporating the innovation within the organization’s values under full support and prioritization from management. Formal policies and procedures were in their early stages of development, and the guidelines for our intervention became the standard. The identified champions, or department leaders, were able to embrace and prioritize the case conferencing intervention by recalling the vision and mission of the Center: to promote the happiness, health, and wealth of all and to engage with the community through direct service and systems change to improve the quality of life in West Baltimore and beyond. The center’s mission and vision relate to the long-term outcome goal of patients achieving their individual care plan goals by providing its residents with the tools and knowledge to succeed.

### **Methods**

The setting of this project was a community center in Southwest Baltimore. The patients, referred to as “neighbors” by the community center, were primarily sourced by community

health workers (CHWs) who, during the implementation phase, were stationed in different areas of Southwest Baltimore. At the start of implementation, the team included: the project leader, Director of Health and Wellness, Case Manager, less-intensive case manager, Workforce Development Coordinator, Director of Cash Campaign (tax preparation and financial advisement services), and twelve CHWs. As the volume of neighbors increased, some new team members were added including a second Case Manager and a social work student. At the start of implementation, team members were educated on the social determinants of health, importance and benefits of interprofessional collaboration, process for submitting referrals, and process of weekly interprofessional case conferencing via PowerPoint Presentation and Question and Answer session.

Neighbors were screened for needs offered by the community center, primarily by the CHWs. Department representatives also screened existing or new neighbors for needs as time allowed and as appropriate. Neighbor contact information and determination of needs, prioritization of needs according to the neighbor, details on staff making referral, and brief notes were submitted via HIPAA compliant Microsoft Forms. In accordance with Non-Human Subjects Research Determination, data was stored on a password protected device and neighbors were deidentified using a “case code” system. A screenshot of the Case Conferencing Referral Form can be found in Appendix B. Neighbors were automatically assigned “case code numbers” and referred to as such to protect identities. Automatic notifications were sent via email to each of the five departments each time a new submission was made. Information was automatically populated into a password-protected web-based Excel document able to be edited and viewed by all team members. A screen shot of this sheet can be found in Appendix C. This served as the primary means of shared documentation, with dedicated columns for each department to provide



updates and notes. A shared folder (Appendix D) was also made available to team members that included weekly agendas and minutes, resources, a document to break down tasks by department, procedural guidelines, educational materials, and a copy of the referral form should a manual form be needed.

Departments reached out individually to neighbors to whom they were referred within 1 week and provided intervention accordingly. Each week, neighbors with three or more biopsychosocial needs from three or more different departments were prioritized to discuss at the case conference to ensure the most vulnerable population received the intervention. Each meeting began by sharing the previous week's data and discussing project strategies, successes, and areas for improvement. Team members made suggestions for project improvement, process changes were agreed upon and made accordingly, and changes were reassessed at the next meeting.

The structure measures included: Case Conferencing Guidelines development and approval, referral form development and approval, documentation tool development and approval, education of staff, and the number of weekly interprofessional case conferences. The process measures included: the number of neighbors discussed at each conference and the attendance of team members at each conference. Data was retrieved weekly via manual count and review and later analyzed via run charts. The project was deemed non-human subject research by the Institutional Review Board.

## **Results**

The results of this project reflect its fluidity throughout the implementation phase as well as its population's unique needs. One hundred percent of department representatives were trained

on the case conferencing process and all materials were approved for use by the Director of Health and Wellness. A run chart for referrals by week can be found in Figure 4. This demonstrates a low of 1, high of 19, and mean of 7.2, representing a wide variation from week to week. At the conclusion of the 15-week implementation period, there was a total of 108 referrals. The large majority of neighbors (78%, n=84) were referred by the community health workers (CHWs). The variation in referral numbers from the CHWs is attributed to location of the CHWs that week, number of CHWs on site any given day, and number of neighbor encounters. During the implementation phase, the community center was in the process of identifying where the highest needs were in the community and where the neighbors were most receptive by stationing CHWs in different neighborhoods in the community center's catchment areas. The breakdown of remaining referrals made by department can be found in Figure 5: Cash Campaign (10%, n=11), Health Suite (7%, n=8), Workforce Development (5%, n=5).

A total of 225 needs were identified. Most neighbors had only 1 need (42.6%, n=46), the most common being employment assistance. Twenty seven percent (n=30) had only 2 needs. The remainder (29.6%, n=32) had 3 or more needs. Having three or more needs was our criteria for discussing neighbors at a conference. For neighbors with three or more needs, a mandatory field was added to the referral form midway through the implementation period. This required that the referrer discuss with the neighbor and document their prioritization of needs. The most common need was Workforce Development (26.2%, n=59), followed by Case Management (24.8%, n=56), Social Work (20.8%, n=47), Health Suite (16.9%, n=38), and Cash Campaign (11.1%, n=25) (Figure 6). Housing was the top need for Case Management.

Figure 7 shows team member attendance. Weeks two, three, five, and thirteen are at zero as no conferences were held that week due to holidays or time given to reach out to neighbors or

document encounters. Weeks six through nine showed attendance at the goal of five, representing 100% of department leaders. There is a positive increase in conference attendance that exceeds the goal by week ten (100%+, n=6). These numbers included one social work student, an additional case manager, and leadership. These staff were added as we had a higher-than-expected volume of neighbors being referred. Leadership attendance encouraged and improved staff compliance with policies and procedures. These interventions improved department's abilities to reach out to neighbors and increased the number of neighbors discussed at each conference.

A run chart for the number of neighbors discussed each week can be found in Figure 8. The first few weeks are at zero for reasons discussed above. By week six we were able to begin having conversations about neighbors as departments were developing relationships, which is why there is an increase in this trend. The average number of neighbors discussed at a conference was eleven. The number of neighbors discussed each week varied (range 5-18) according to complexity of the neighbors on that week's schedule. We had a total of 89 discussions about 34 different neighbors during the implementation period. Discussions included information such as: neighbor demographics, neighbor prioritization of needs, actual or potential challenges for neighbors reaching goals, and strategies for team members to work together to help the neighbor to reach his or her goals.

Outcome measures included the number of neighbors who achieved their individual goals. Examples of goals include: obtaining vital documents (license or social security card), preparation and submission of tax documents, securing a job interview or obtaining employment, securing housing or temporary shelter, or identifying ways to afford medications. Preliminary results at the completion of the quality improvement project are summarized in Figure 9. In the

15-week implementation period, 12% (n=12) of neighbors met their individual goals. Twenty four percent (n=25) were still actively working with departments. Twenty eight percent (n=29) were lost to follow-up, meaning that the team was able to get in touch with them but later lost contact. The team was unable to initially contact 36% (n=37) of neighbors for various reasons such as suspected incorrect contact information, phone lines disconnected, etc. Guidelines for the project were that each department made at least two attempts to contact the neighbor before removing them from their list. 36% (n=37) of neighbors were not able to be reached. This is due to a number of reasons, such as possible incorrect contact information or temporary phone lines being disconnected.

### **Discussion**

Consistent with findings discussed in the literature review, this case conferencing intervention accomplished the following: encouraged team collaboration, fostered interprofessional problem solving, promoted patient-centered care that focused on patient goals and preferences, permitted better use of patient use of resources, and addressed all elements of the social determinants of health (Brooks et al., 2020; Jegu et al., 2018; Pascucci et al., 2021; Reeves et al., 2017; Stergiopoulos et al., 2010; Tricco et al., 2014; and Weppner et al., 2018). As different neighbor needs were identified and discussed, team members worked together to find and share new resources throughout the city and create interdepartmental plans of care. These were added to a shared “master” document of referral sources easily accessible by interprofessional team members.

Limitations include imprecision in the initial project design and the efforts made throughout the implementation phase to adjust for the limitations. The design did not account for neighbor volume and initially lacked specificity of procedures such as when and how to contact

neighbors and the organization of conferences. While this is considered a limitation, the weekly team meetings enabled staff to work together to update the procedures and policies in “real time.” This allowed the referral system and case conferencing process and procedure to adapt to department’s existing workflows. Another benefit of these meetings was the gradual improved understanding between team members of department roles and responsibilities. Similar to the themes of patient-centered care identified by Brooks et al. (2020), the team’s flexibility, ability, and willingness to contribute to process changes was critical to the success of the project. We agree with Pascucci et al. (2021) that more clarity in future studies is needed regarding specific methods and frequency of collaboration to improve future project designs.

There were several barriers that threatened the success of the project. Initially, staff lacked availability to reach out to the unanticipated volume of referred neighbors. The data previously discussed provided the center with better information regarding its population needs and supported additional staff support from leadership to help address neighbor needs. Leadership (associate director) became actively involved midway through the implementation phase to address these shortcomings. They allowed for social work student involvement and the addition of a second case manager to the team. This member of the leadership team also began to attend meetings, provide insight and feedback, and encourage staff adherence to the procedures.

A second barrier was the transience of the population and difficulty establishing or maintaining communication. To reduce the number of neighbors lost to follow-up or with whom the team was initially unable to connect, a critical change was made to the process after the project’s implementation phase. At time of initial neighbor encounter and referral, an appointment will be made with the referred department. That department will then reach out to

confirm the appointment. This change is anticipated to reduce numbers of neighbors lost in the system and increase the number of neighbor goals met.

In summary, this project's outcomes align with two of Health People 2030's top five goals: to promote health and well-being for all and to eliminate health disparities and achieve health equity (U.S. Department of Health and Human Services, 2022). The changes made throughout and after the fifteen-week implementation period were made to promote sustainability of the project and were a result of the lessons learned.

### **Conclusion**

Strengths of the project's sustainability are directly related to the leadership's support of the project. At the conclusion of the project's implementation phase, several changes were in process to improve and sustain the outcomes. These include hiring of a new staff member with a specific role of interprofessional case conference lead and expansion of outside referral sources. Future work includes the hiring of additional staff as new neighbors continue to be referred to the community center and inclusion of more of the community center's departments in the process. Including the neighbor as part of the team's discussion is an additional idea for improvement in patient-centered care.

The findings of this quality improvement project are particularly important to health care delivery and quality of health care in the United States as a whole. We can conclude that interprofessional case conferencing is an effective method for interdepartmental collaboration. The method and procedure used in the implementation of this project can be individualized and applied to multiple settings and organizations.

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Impact of a complex chronic care patient case conference on quality and utilization.

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Table 1

Evidence Review Table

Citation: Brooks, E. M., Winship, J. M., & Kuzel, A. J. (2020). A “Behind-the-Scenes” Look at Interprofessional Care Coordination: How Person-Centered Care in Safety-Net Health System Complex Care Clinics Produce Better Outcomes. <i>International Journal of Integrated Care (IJIC)</i> , 20(2), 1–10. doi:10.5334/ijic.4734					Level VI
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“This research sought to answer the following questions: How do interprofessional teams organize themselves to holistically address medical and social complexity? How is an emphasis on person-centered care established and maintained? And how do regular care coordination meetings facilitate positive health outcomes?”	Exploratory Observational Case Study	Virginia Commonwealth University Health System’s Complex Care Clinic (an interprofessional clinical team that provides care coordination and case management), 700 patients.  20 observed care-coordination meetings not specified.  10 interviewees (all members of the team with the exception of one MD).	Observation of 20 weekly care-coordination meetings that were audio recorded and transcribed over 4 months: researchers did not sit at the table with the team, but sat in the back as an “observer.”  Interviews with team members: semi-structured, lasting between 35-45 minutes, and conducted individually/private. Questions included: clinic processes and procedures, difficulties, successes, patient engagement, & team-based care.	Hospitalizations Emergency department visits Symptoms Adherence Cost of care	44% reduction in inpatient hospitalizations, 38% decrease in use of the emergency department use, and 49% reduction in total hospital costs within the first year of implementation. There was a total of \$4 million total cost savings. In summary, the program increased the ability to provide services, prevent overuse of services, and make more effective use of services.  There are three themes that contribute to patient-centered care: “Team-based communication strategies (flexible team leadership, role-blurring), interprofessional problem-solving, and personalized patient

					engagement efforts (incorporating the patient’s goals and preferences).”
Citation: Jego, M., Abcaya, J., Ștefan, D.-E., Calvet-Montredon, C., & Gentile, S. (2018). Improving Health Care Management in Primary Care for Homeless People: A Literature Review. <i>International Journal of Environmental Research and Public Health</i> , 15(2). doi:10.3390/ijerph15020309					Level: VII
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“In this review we aimed to describe the main characteristics of primary care programs (organizations or interventions) that take care of homeless people, and to identify which could be most relevant.”	Literature Review	<p>MEDLINE, PsycINFO, COCHRANE library, and Cairn.info were searched for articles that describe and evaluate primary care programs for the homeless. Two reviewers screened the articles.</p> <p>Included: All articles, even if not high-quality or comparative studies.</p> <p>704 articles were narrowed down to 19. Sample sizes ranged from 45-3543 patients.</p> <p>Inclusion: Articles were included if they provided a strong description of the program and an evaluation of the intervention regardless of level of evidence.</p>	<p>Most programs involved team-based, multidisciplinary, and/or integrated care with a patient-centered approach involving case management, social management, and on-site basic needs.</p> <p>Many programs had co-located multiple services (primary care, mental health, social support, etc.)</p>	Experience and satisfaction of care by homeless patients, social and housing status, and access to and use of healthcare services.	Programs tailored to the specific needs of homeless people should use team-based, multidisciplinary, and/or integrated care that is patient centered, offers multiple services at a single site, includes social support (i.e. housing support), engagement in the community, and includes a clinic orientation.

Citation: Pascucci, D., Sassano, M., Nurchis, M. C., Cicconi, M., Acampora, A., Park, D., Morano, C., & Damiani, G. (2021). Impact of interprofessional collaboration on chronic disease management: Findings from a systematic review of clinical trial and meta-analysis. <i>Health Policy</i> , 125(2), 191–202. doi:1016/j.healthpol.2020.12.006					Level: I
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“The aim of this study was to assess the impact of IPC interventions on the management of chronic patients compared to usual care.”	A systematic review and meta-analysis of Randomized Controlled Trials (RCTs)	Search Strategy: EMBASE, ISI Web of Knowledge, and MEDLINE databases were searched, followed by a snowball search. Words such as “chronic disease/illness/condition” and “interprofessional collaboration/team” were used. Two investigators reviewed the results. Inclusion criteria: studies that quantitatively assessed outcomes and processes of interprofessional collaboration interventions compared to usual care for patients with chronic conditions. Only studies classified as “fair or good” quality were included. Excluded: Studies other than clinical trials or those that included students as part of the interprofessional team.  11,128 studies were found in the literature search, with 10 additional through	Interventions varied among studies but were not specified.  Several meta-analyses were conducted due to the diversity of interventions and performed using STATA software.	8 studies: systolic blood pressure  8 studies: HbA1c levels  5 studies: LDL  4 studies: diastolic blood pressure  4 studies: smoking cessation  8 studies: mortality  2 studies: end-stage renal disease  3 studies: length of hospitalization  2 studies: influenza vaccination coverage  2 studies: diabetic foot examination using monofilament examination.  3 studies: retinal screening examination  7 studies: quality of life scales	Systolic blood pressure was significantly lower in the intervention group. A statistically significant difference ( $p < 0.0001$ ) in favor of the interprofessional collaboration.  5/8 studies showed a significantly lower HbA1c level. The meta-analysis showed a significant difference in favor of collaboration ( $p < 0.0001$ ).  LDL levels decreased in intervention groups ( $p = 0.214$ ).  Lower diastolic blood pressure in intervention groups ( $p = 0.122$ ).  Insufficient evidence for smoking cessation and mortality.  No significant difference in end-stage renal disease.  Lower days of hospitalization with

		<p>snowball searching. 8149 remained after duplicates were removed. 23 of 55 potentially relevant articles were selected and included in the systematic review. Of the 23, 13 were incorporated into the meta-analysis.</p> <p>Strong heterogeneity.</p>			<p>interprofessional collaboration (p=0.036).</p> <p>Statistically significant increase in vaccination coverage.</p> <p>More frequently occurring monofilament foot examinations</p> <p>Insufficient level of evidence in regard to retinal screening examinations.</p> <p>Statistically significant changes in quality of life scores for some studies; insufficient level of evidence for others.</p>
<p>Citation: Reeves, S., Pelone, F., Harrison, R., Goldman, J., &amp; Zwarenstein, M. (2017). Interprofessional collaboration to improve professional practice and healthcare outcomes. The Cochrane Database of Systematic Reviews, 6, CD000072. doi: 10.1002/14651858.CD000072.pub3</p>					<p>Level: I</p>
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
<p>“To assess the impact of practice-based interventions designed to improve interprofessional collaboration (IPC) amongst health and social care professionals, compared to usual care or to an alternative</p>	<p>Systematic Review</p>	<p>Search Strategy: CENTRAL, MEDLINE, CINAHL, ClinicalTrials.gov, WHO International Clinical Trials Registry Platform databases and interprofessional journals were searched through 2015, including the references lists of each.</p>	<p>Interventions varied between studies and included: interprofessional rounds, interprofessional meetings, interprofessional checklists, and externally facilitated</p>	<p>Primary outcomes included: 1. Patient health outcomes: mortality, morbidity, disease incidence or duration, cure rates, quality of life measures, functional status, complication rate, patient-assessed quality of care. All</p>	<p>Interventions to improve interprofessional collaboration may improve clinical process and efficiency and patient outcomes compared to usual care.</p> <p>Externally facilitated interprofessional</p>

<p>intervention, on at least one of the following primary outcomes: patient health outcomes, clinical process or efficiency outcomes or secondary outcomes (collaborative behaviour).”</p>		<p>At least two authors reviewed the results. Initial search totaled 1083 abstracts once duplicates were removed. Eligible Studies: The review includes only individual or cluster-randomized studies that implemented practice-based interventions to improve collaboration between two or more healthcare professionals. Included: 9 studies (540 participants): 6 cluster randomized trials and 3 individual randomized trials Excluded: Studies whose intervention was not practice-based interprofessional collaboration.</p>	<p>interprofessional activities.</p>	<p>outcomes used validated instruments. 2. Clinical process or efficiency: readmission rates, adherence to recommendations, continuity of care, use of healthcare resources, and participant satisfaction. Secondary outcomes: Objective or self-reported outcomes of collaborative behavior.</p>	<p>activities (4 studies) may improve functional status and adherence. Interprofessional rounds (2 studies) may improve use of resources. Interprofessional meetings (1 study) may improve adherence and use of resources. Interprofessional checklists (1 study) may improve use of resources. Video/audio conferencing vs. audio conferencing alone (1 study) is more efficient.</p>
<p>Citation: Stergiopoulos Vicky, Dewa Carolyn S., Tanner Gordon, Chau Nancy, Pett Mike, &amp; Connelly Jo Lynn. (2010). Addressing the Needs of the Street Homeless: A Collaborative Approach. International Journal of Mental Health, 39(1), 3–15. doi:10.2753/IMH0020-7411390101</p>					<p><b>Level: VI</b></p>
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
<p>“The purpose of this article is to describe a collaborative interagency, multidisciplinary street outreach team and the profile of the clients it serves.”</p>	<p>Individual Cohort Study</p>	<p>The first 25 clients to be referred to the team. Eligibility requirements: absolute homelessness, failure to engage with less resource intensive programs, and severe or persistent mental illness.</p>	<p>A clinical street-based multidisciplinary outreach team to provide services focusing on: frequent contact with clients and identifying and addressing needs.</p>	<p>Chi-square tests and paired student’s t-tests compared the following demographics at baseline and 6 months after the intervention: housing (type of housing, nights spent on the street, preferred</p>	<p>84% of clients at baseline lived on the streets, and at 6 months 2/3 were no longer living on the street or in a shelter. 96% had spent &gt;90 nights on the street at baseline, and at six</p>

		<p>Demographics: 40% women; 40% &gt;50 years old; 28% between ages 21-29; &gt;3/4 never married; 70% without a diploma; 83% with annual household income &lt;\$10,000.</p>	<p>A shared, integrated clinical record.</p> <p>Communication and collaboration through team meetings and joint client visits.</p>	<p>living of the client); functioning (Global Assessment of Functioning Scale, GAF); and substance abuse/dependence (Drug Abuse Screening Test, DAST-20).</p>	<p>months only 40% reported sleeping on the street.</p> <p>At baseline, average GAF score was 30/100; six months later the average was 49/100. (p&lt;0.0001)</p> <p>At baseline half of clients reported a moderate to high level of drug abuse, and six months later only 1/4 were at moderate or higher levels.</p> <p>In summary: interagency collaboration can lead to improved access to care and collaborative multidisciplinary teams can partner health, housing, and social services, thus expanding pathways to comprehensive, patient-centered care.</p>
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Citation: Tricco, A. C., Antony, J., Ivers, N. M., Ashoor, H. M., Khan, P. A., Blondal, E., Ghassemi, M., MacDonald, H., Chen, M. H., Ezer, L. K., & Straus, S. E. (2014). Effectiveness of quality improvement strategies for coordination of care to reduce use of health care services: a systematic review and meta-analysis. <i>CMAJ : Canadian Medical Association Journal = Journal de l'Association Medicale Canadienne</i> , 186(15), E568–E578. doi:10.1503/cmaj.140289					Level: I
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
“To assess the effectiveness of quality improvement strategies for care coordination for patients who are frequent users of the healthcare system.”	Systematic Review and Meta-Analysis	<p>Search Strategy: MEDLINE, Embase, and the Cochrane Library were searched by two librarians for randomized controlled trials done between 1987-2014 that assessed quality improvement strategies for coordination of care for the disproportionate number of patients who frequently use the healthcare system.</p> <p>Eligible studies: RCTs that assessed 1 of 5 pre-determined quality improvement strategies; adults who are frequent users of the health care system. These interventions were compared with usual care/no intervention.</p> <p>Of 11,107 potentially relevant reports, 50 were included. 36 RCTs and 14 companion reports totally 7494 patients were included.</p>	Interventions varied between studies and those that incorporated care coordination utilized the following: case management, defined as the coordination of care and ongoing patient management (29); team changes such as use of multidisciplinary teams or expansion/clarification of roles (21); promotion of self-management such as providing access to resources or establishing joint goals to empower patients (19); and clinical information systems that perform a variety of functions (1).	Hospital admissions, emergency department visits, hospital length of stay, and clinic visits.	<p>Significantly fewer patients in the intervention group were admitted to the hospital (particularly case management, team changes, promotion of self-management, and patient education).</p> <p>Significantly fewer of patients aged 65 years and older visited the emergency department.</p> <p>There was no significant difference in number of visits to the emergency department in those &lt;65 years old; effect of length of stay in hospital; or effect on number of clinic visits.</p>



		12 of these studies included homeless patients.  Strong heterogeneity.			
Citation: Weppner, W. G., Davis, K., Tivis, R., Willis, J., Fisher, A., King, I., & Smith, C. S. (2018). Impact of a complex chronic care patient case conference on quality and utilization. <i>Translational Behavioral Medicine</i> , 8(3), 366–374. doi:10.1093/tbm/ibx082					Level: IV
Purpose/ Hypothesis	Design	Sample	Intervention	Outcomes	Results
<p>“The aims of this study were to evaluate the impact of an interprofessional case conference on the following: clinical contacts with PCPs and members of the primary care team; (ii) quality of care of chronic diseases; and (iii) utilization of urgent care, emergency department, and hospitalizations. We hypothesized that the quality of care measured by improvements in indices of chronic disease (i.e., hemoglobin A1C and blood pressure) would improve in the intervention group compared with controls, that clinical contacts with the core PACT primary care team would increase in comparison to controls,</p>	<p>Prospective Case-Control Trial with Propensity score matching (Observational Trial)</p>	<p>Sample: Convenience sample from 2,000 total veterans. A clinic-based RN coordinator provided frequent lists of the 5-10 highest risk patients using the CAN score or overall propensity score, and participants selected one per conference for discussion</p> <p>Eligible: 128 Accepted: 104 Control:104 Intervention: 104</p> <p>Power Analysis: An 80% power were attained and deemed appropriate.</p> <p>Group Homogeneity: Patients with similar characteristics of gender, age predicted risk of death or hospitalization, and death within 6 months of presentation.</p>	<p>The study was conducted over 26 months at an interprofessional primary care clinic.</p> <p>Control: Usual care</p> <p>Intervention &amp; Protocol: An hour long biweekly conference in which two trainees present patients to an interprofessional team. The conference is facilitated using the “EFFECT approach: “EFFECT” approach, specifically (a) Eliciting a patient-centered narrative, (b) Facilitating an interprofessional team discussion, (c) Evaluating clinical evidence, (d) Creating a shared care plan, and (e) Tracking outcomes.” At the end of the conference, the shared care plan was</p>	<p>Blood pressure and A1c prior to the conference and 6 months after the Conference were measured. Baseline patient characteristics were compared with t-test and chi-square analysis using 2 month segments to compare trends. ANOVA tests were used.</p>	<p>There was a significant increase in team encounters preceding and following the conference (p=0.0002). There was no significant difference in blood pressure or hemoglobin A1C.</p> <p>Interprofessional conferences may facilitate increased team involvement and reduce hospitalization rates by averting unplanned medical care.</p>

and that utilization of urgent care, emergency room, and hospitalizations would decrease in the intervention group compared with controls.”			completed and tasks were assigned. “Warm hand-offs” were also done at this time.		
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Table 2

Evidence Synthesis Table

<b>Evidence Based Practice Question (PICO):</b> Does interprofessional collaboration vs. usual care improve patient outcomes for patients with multiple complex needs?			
<b>Level of Evidence</b>	<b># of Studies</b>	<b>Summary of Findings</b>	<b>Overall Quality</b>
<b>I</b>	<b>3</b>	<p>Pascucci et al. (2021) found that interprofessional collaboration versus usual care resulted in a reduction in the levels of systolic and diastolic blood pressure, HbA1c, LDL, duration of hospitalization, and smoking for patients with chronic illnesses. There was an uptake of influenza vaccine coverage and number of diabetic foot examinations performed. There was no significant difference in end-stage renal disease, smoking cessation, and mortality. Findings were overall positive and demonstrate that interprofessional collaboration enhances patient centered, coordinated care. The authors acknowledge that more clarity in future studies is needed regarding specific methods and frequency of collaboration.</p> <p>Tricco et al. (2014) assessed the effectiveness of quality improvement strategies for care coordination and their impact those who frequently use the healthcare system. The interventions varied between studies and included: case management, defined as the coordination of care and ongoing patient management (29); team changes such as use of multidisciplinary teams or expansion/clarification of roles (21); promotion of self-management such as providing access to resources or establishing joint goals to empower patients (19); and clinical information systems that perform a variety of functions (1). Significantly fewer patients in the intervention group were admitted to the hospital (particularly case</p>	<p>B. This was a systematic review and meta-analysis of randomized controlled trials of a relatively large size with strict study quality assessment measures. There is significant heterogeneity. The control for all studies was specific, and the authors only included interventions that were compared to strongly defined “usual care.” The results were consistent throughout all studies.</p> <p>B. This was a systematic review and meta-analysis with consistent result. Despite the large sample size, heterogeneity caused some outcomes to only be assessed for a small number of studies. The authors acknowledge that their analysis was limited as the implementation interventions were complex and interconnected, however the quality of evidence was solidified through a sensitivity analysis.</p>

		<p>management, team changes, promotion of self-management, and patient education). Significantly fewer of patients aged 65 years and older visited the emergency department. There was no significant difference in number of visits to the emergency department in those &lt;65 years old; effect of length of stay in hospital; or effect on number of clinic visits. The authors suggest that more research needs to be done to determine how to best practice and optimization of care coordination for specific patients and settings.</p> <p>Reeves et al. (2017) evaluated the impact of practice-based interventions on improved collaboration between two or more healthcare professionals. The types of interventions included: externally facilitated interprofessional activities (4), interprofessional rounds (2), interprofessional meetings (1), interprofessional checklists (1), and video/audio conferencing versus audio conferencing alone. The authors found that these interventions may improve clinical process and efficiency and patient outcomes compared to usual care such as: improvement in functional status, improvement in adherence, and improved use of resources.</p>	<p>B. This was a Cochrane systematic review of randomized studies with strict inclusion criteria and a small sample size. The authors graded most of the evidence as “low.” A meta-analysis was not possible due to strong heterogeneity among the interventions. However, results were generalizable and similar.</p>
<p><b>IV</b></p>	<p><b>1</b></p>	<p>Weppner et al. (2018) sought to evaluate the impact of case conferencing on clinical contacts, quality of care, and utilization of services. High risk patients were selected by a RN coordinator and an hour long case conference allowed for two trainees to present patients to an interprofessional team and a shared care plan was developed. Although there was no significant difference in blood pressure and A1C before and after the implementation of the conferencing, there was a significant increase (p=0.0002) in team encounters preceding and following the intervention. In summary,</p>	<p>A. This is a prospective case-control trial with a moderate sample size with strong homogeneity and an appropriate power analysis. Outcomes were statistically significant.</p>

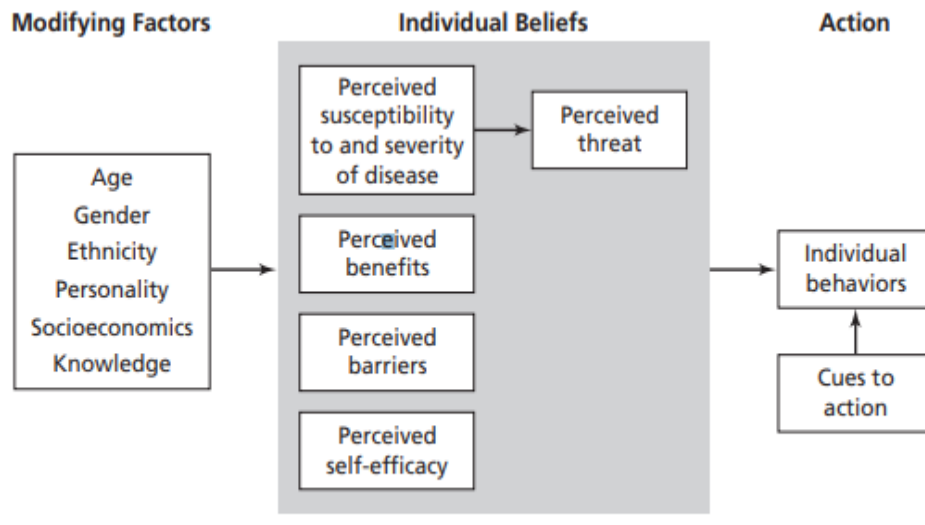
		interprofessional conferences may facilitate increased team involvement and reduce hospitalization rates by averting unplanned medical care.	
<b>VI</b>	<b>2</b>	<p>Brooks et al. (2020) observed 20 weekly care-coordination meetings and interviewed members an interprofessional clinical team. This particular clinic saw a 44% decline in inpatient hospitalizations, 38% decrease in emergency department use, and 49% reduction in total hospital costs within the first year of implementation, with a total of \$4 million total cost savings. The authors identified three themes that contribute to patient-centered care: team-based communication strategies (flexible team leadership, role-blurring); interprofessional problem solving; and personalized patient engagement efforts (incorporating the patient’s goals and preferences).</p> <p>Stergiopoulos et al. (2010) described how a multidisciplinary street outreach team improved the outcomes of street homeless. These teams focused on frequent contact with clients and identifying/addressing their needs; development of a shared and integrated clinical record; and communication and collaboration through team meetings and/or joint client visits. The team saw improvements in numbers of clients living on the street, increases in functional abilities via the Global Assessment of Functioning scale, and decreases in substance abuse based on the Drug Abuse Screening Test tool. In summary: interagency collaboration can lead to improved access to care and collaborative multidisciplinary teams can partner health, housing, and social services, thus expanding pathways to comprehensive, patient-centered care</p>	<p>B. This is an exploratory observational case study with a small sample size, however the organization has strong data and outcomes.</p> <p>B. This was an individual cohort study with a small sample size of only 25 patients, however they used measureable and evidence-based outcome strategies.</p>
<b>VII</b>	<b>1</b>	Jego et al. (2018) sought to identify which primary care program organizations or interventions could be most relevant to the homeless population. The most successful programs involved team-based, multidisciplinary, and/or	B. This is a literature review with a relatively thorough and appropriate search strategy. The authors adequately applied the results to the population with easily drawn conclusions.

	integrated care with a patient-centered approach involving case management, social management, and on-site basic needs.	
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Figure 1

**Figure 1**

*Health Belief Model Components and Linkages*



**FIGURE 3.1.** Health Belief Model Components and Linkages.

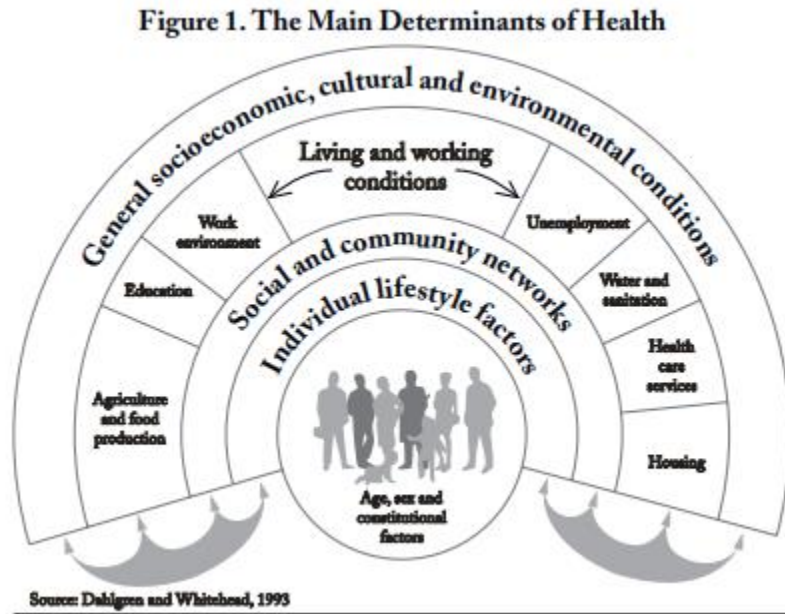
Interprofessional Team provides comprehensive care to reduce barriers, develop strategies to activate readiness, and enhance confidence in patient ability to take action

Source: Glanz, K., Rimer, B. K., & Lewis, F. M. (2008). Health behavior and health education: theory, research, and practice. 4th Ed. Jossey-Bass.

Figure 2

**Figure 2**

*The Conceptual Framework of Complex Innovation Implementation*



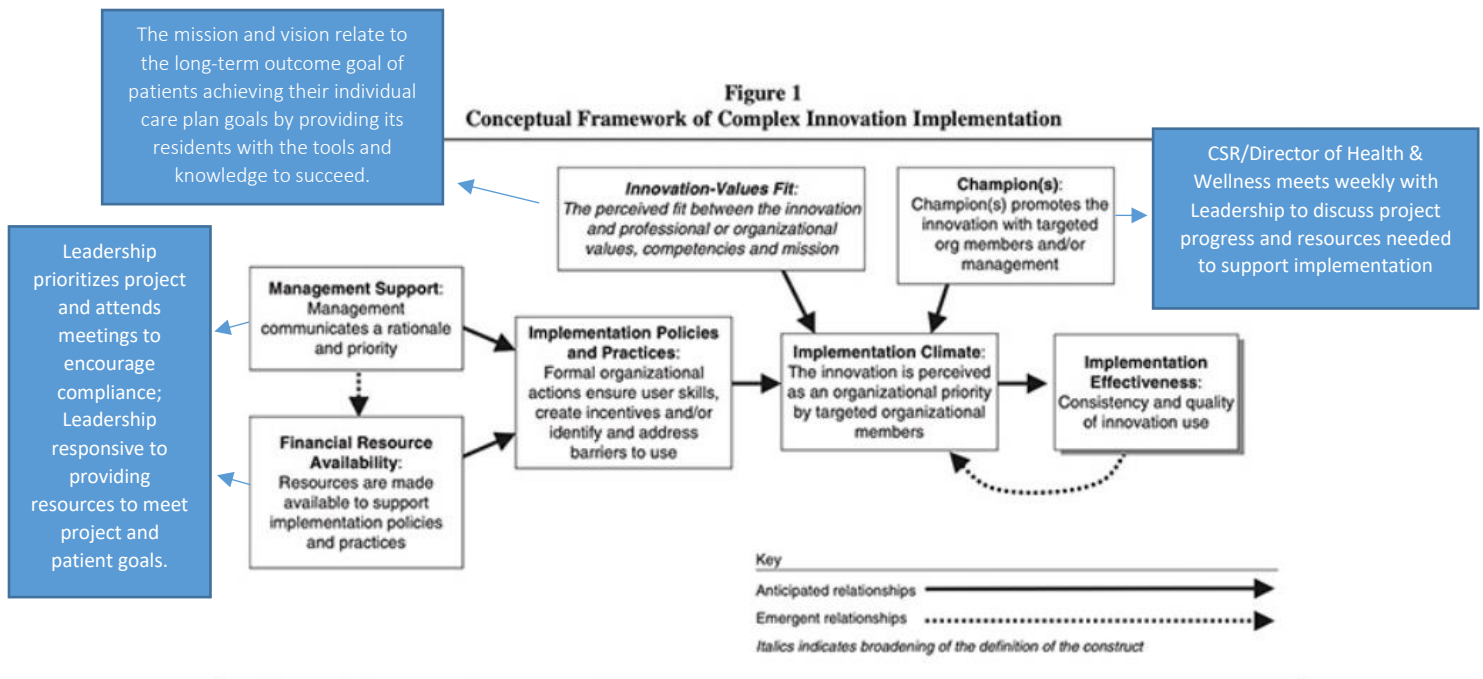
Source: Dahlgren & Whitehead. (2006). European strategies for tackling social inequities in health: Levelling up Part 2. World Health Organization Europe. Retrieved from: [https://www.euro.who.int/\\_data/assets/pdf\\_file/0018/103824/E89384.pdf](https://www.euro.who.int/_data/assets/pdf_file/0018/103824/E89384.pdf)



Figure 3

**Figure 3**

*Conceptual Framework of Complex Innovation Implementation*



Source: Adapted from Klein and Sorra (1996, 1056).

Source: Helfrich, C.D., Weiner, B.J., McKinney, M.M. & Minasian, L. (2007). Determinants of implementation effectiveness adapting a framework for complex innovations. *Medical Care Research and Review*, 64(3), 279-303 doi: 10.1177/1077558707299887

Figure 4

**Figure 4**

*Case Conferencing Referrals by Week*

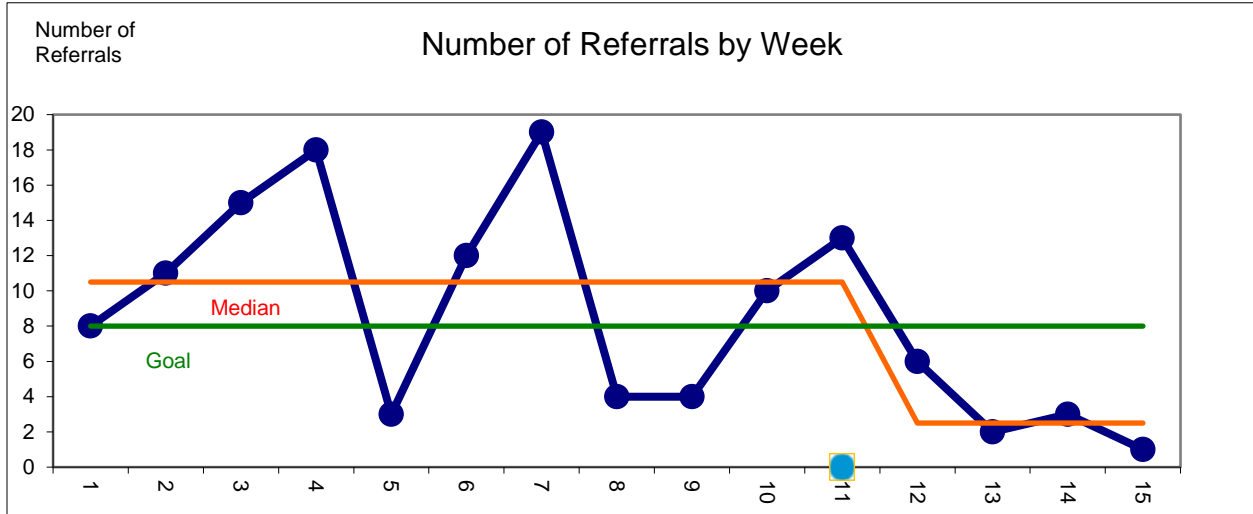


Figure 5

**Figure 5**

*Referral Source by Department*

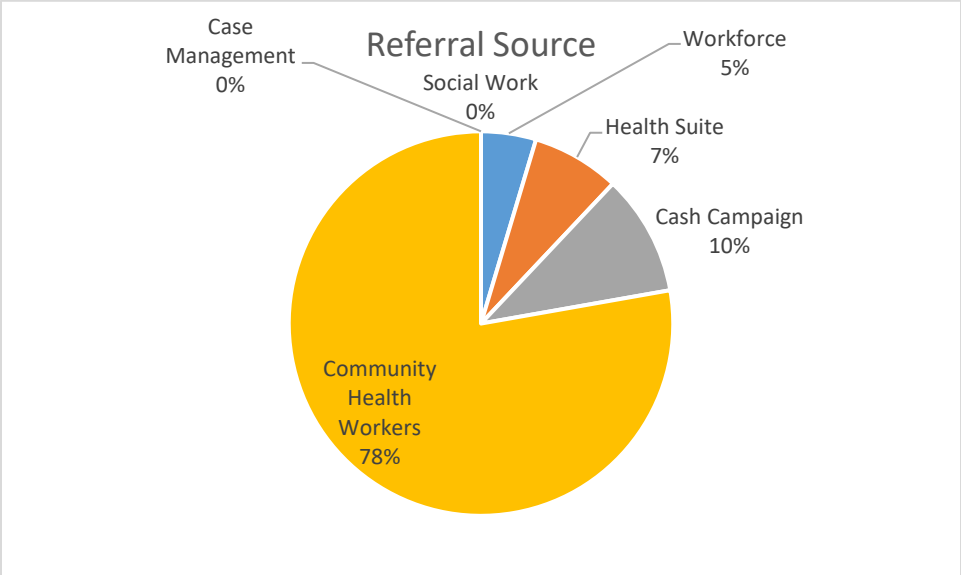


Figure 6

**Figure 6**

*Neighbor Needs by Department*

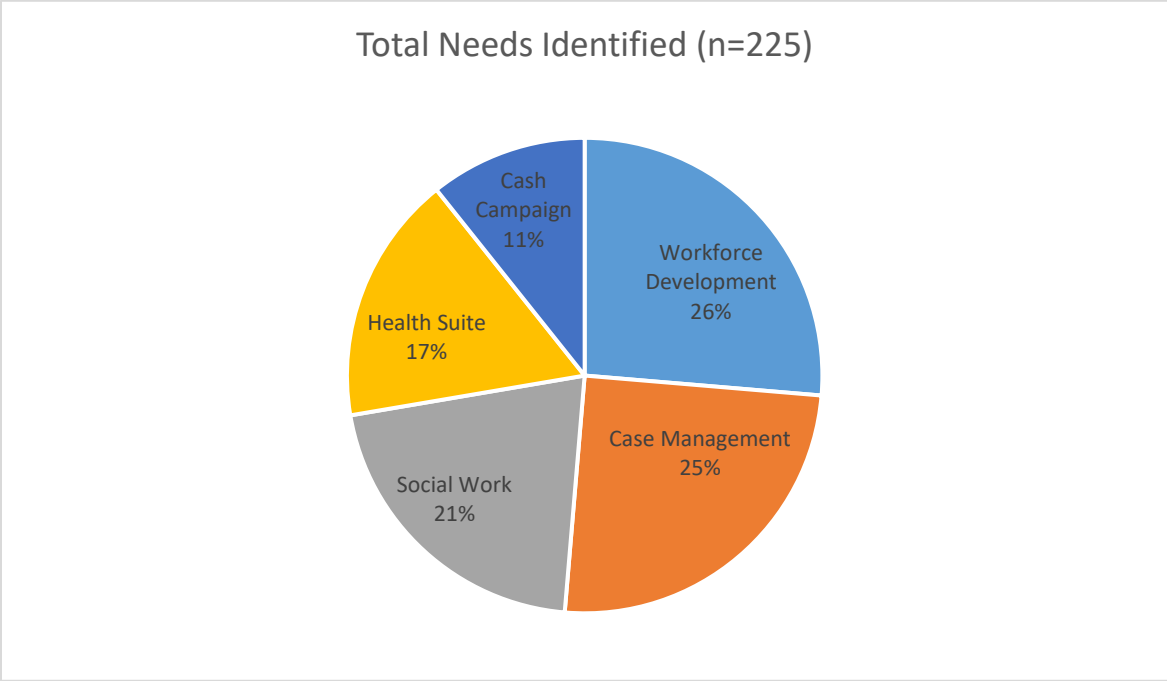


Figure 7

**Figure 7**

*Staff Attendance by Week*

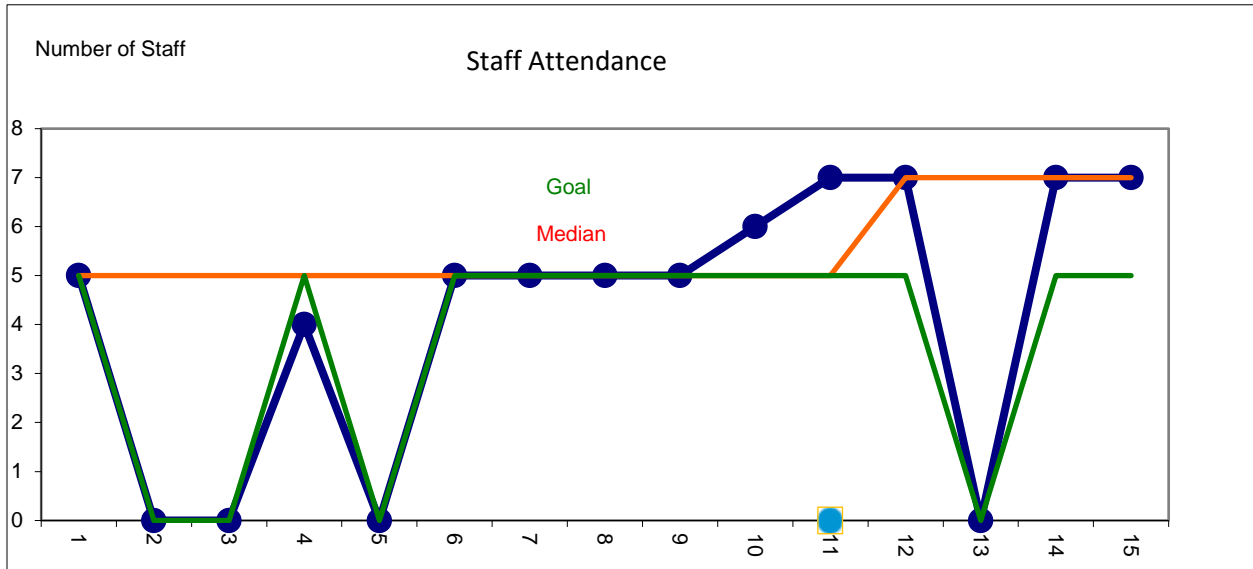


Figure 8

**Figure 8**

*Neighbors Discussed by Week*

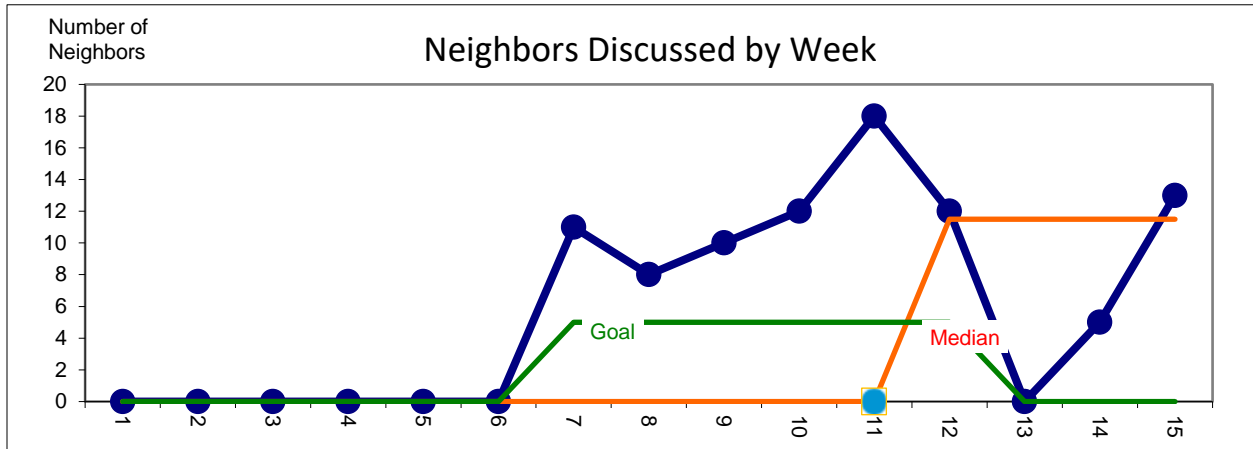
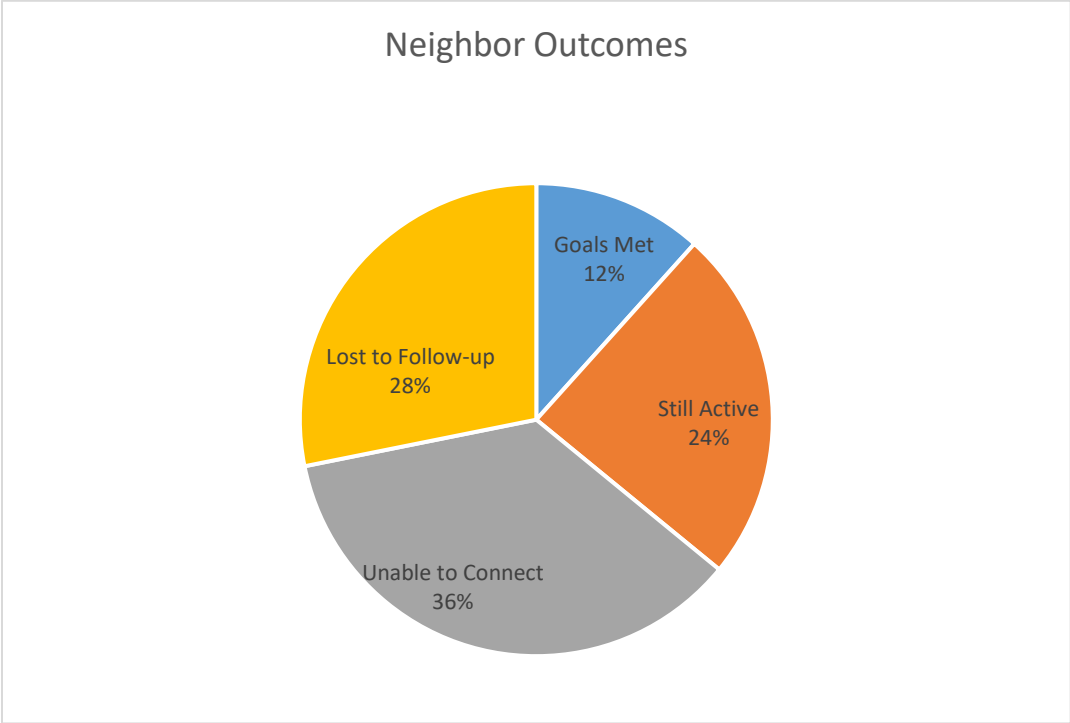


Figure 9

**Figure 4**

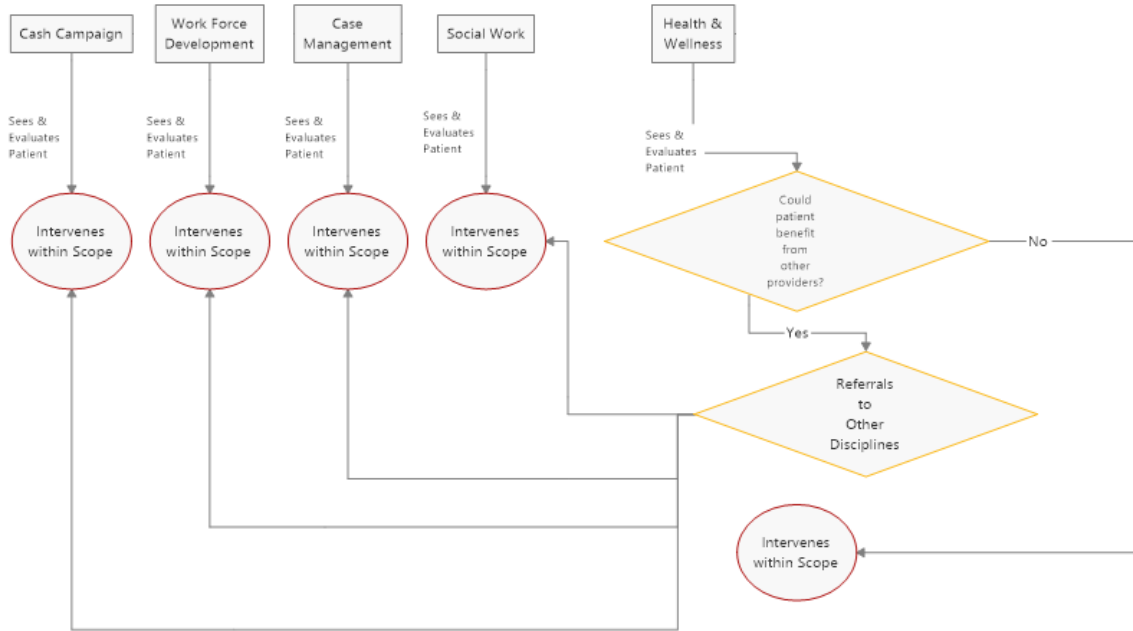
*Neighbor Outcomes: Preliminary Results*



Appendix A

Process Flow Map Pre-Implementation

Current State



	Start/End	Represents a start or end point
	Direction or Flow	A connector that shows relationships between shapes
	Input/Output	Represents input and output
	Do something	Represents a process
	Decision	Indicates a decision



Appendix B

Case Conferencing Referral Form

# Interprofessional Case Conferencing Referral Form



\* Required

1. Referral Date \*

2. Patient Name \*

3. Phone Number \*

4. Zip Code \*

4. Zip Code \*

5. Email Address \*

6. Preferred Method of Contact \*

Phone

Email

Unsure

7. Is the patient agreeable to working with the interprofessional team to address their needs? \*

Yes

No

Unsure

8. If yes, does the patient consent to share information? \*

Yes

No

Unsure

9. Case Management: difficulty paying bills, eviction assistance, housing. \*Must have some form of income, be in specified zip code (21223, 21201, or 21230), have school-aged children, and be in immediate danger of becoming homeless. \*

Yes

No

10. Social Work (Brooke): housing/emergency shelter (provide zip code in notes below), vital documents, emergency food, assistance with MTA Mobility application, applying for energy/utilities assistance. \*

Yes

No

11. Workforce Development: employment, job readiness, and adult education \*

Yes

No

12. Health and Wellness: disease management and health questions; health education, goal setting, health coaching; accessing providers/referrals or linkage to care; appointment assistance; assistance reducing barriers to healthy living; mental health services; substance abuse treatment; prescription assistance \*

Yes

No

13. Cash Campaign: tax preparation services, benefits screening, financial planning, financial coaching \*

Yes

No

14. Please summarize neighbors needs here. If multiple needs identified, please list needs priorities in order from most to least important as specified by the neighbor \*

Enter your answer

15. Person Submitting Referral \*

Enter your answer

16. Preferred Contact Information (Phone, Email, or Both) \*

Enter your answer

17. Referral Source \*

Workforce Wednesday

CEC HRSA Outreach

HRSA CHW

Health Suite

Cash Campaign

211

Case Management

Appendix C

Shared Documentation Tool

Case Code	Case Management Notes	211 Notes	Workforce Notes	Health & Wellness Notes	Cash Notes	Patient Status
67	83		10/12 There's no way to contact this person.	no info		
68	84		10/12 LR called, left msg and sent email. 11/2 LR called and left a msg.			
69	85	10/26-Voice mail message left for caller.	10/29 LR is waiting to hear from the health suite about patient's health before contacting. 11/2 LR called and left message. 11/16 10/26/21 10/26/21	10/19 lm, 10/20 lm		
70	86		10/26 LR called and sent email. KS is interested in evening position. Is only available to meet in the mornings. 11/2 Spoke with KS and she's made an appointment.			WF only
71	87	10/26-Voice mail message left for caller.	10/20 TC attended WW on 10/13. Started looking at URMAC positions. Sent him to MD CAGR. 10/26 LR left message.	10/20 lm 11/2 lm	10/13 - Answered general tax questions, but did not make appointment for services.	
72	90		11/2 LR spoke with TS. She doesn't get off of work until 5:30pm. I sent her an email with WW details and an invitation to make an appointment with me one evening - just not tonight.			WF and CM.
73	91	10/26-Voice mail message left for caller.	10/26 LR left message and sent email. 11/2 Spoke with EH. Interested in WW but maybe not this week. Sent her an email with details.	11/9 need to call again for appt on Thur after 11/27 set appt no show 11/9 hs appt.		HS only HS only
74	92				Duplicate (see #66)	
75	93				11/8 - did not pick up and no option to re-avail a consultant.	
76	94				11/3 - left voicemail; 11/9 - left voicemail; no response	
77	95					
78	96				number not in service	
79	97		11/2 LR left message;			
80	98					
81	99					
82	100					
83	101					

Appendix D

Team Shared Folder

