

Community Health Workers as a Component of the Health Care Team



Sheri L. Johnson, PhD^a, Veronica L. Gunn, MD, MPH^{a,b,*}

KEYWORDS

- Community health worker • PCMH • Health care access • Care continuum
- Care coordination • Navigators • Promoters

KEY POINTS

- Evidence supports the positive impact of community health workers (CHWs) on some pediatric health care outcomes.
- Opportunities for continued integration of CHWs into the pediatric health care delivery system are expanding.
- Continued rigorous research demonstrating reduction in health care disparities and improved health outcomes is warranted.

INTRODUCTION

Community health workers (CHWs) create connections between health care systems, local community residents, and community-based organizations to increase health care access, promote appropriate levels of care utilization, and improve health outcomes for individuals and populations. In the United States, CHWs are defined as “frontline public health workers who are trusted members of and/or have an unusually close understanding of the community they serve.”¹ CHWs often focus on reaching socially and economically disadvantaged groups and bridging cultural divides between patients, communities, health care providers, and health care systems.^{2–4} CHWs also engage in policy advocacy^{5,6} and community-based research⁷ aimed at improving conditions necessary for health.

Ideally, a bidirectional flow of knowledge and resources enables CHWs and health systems to improve how health care services are delivered to specific populations.

Disclosure: The authors have no conflicts of interest to disclose.

^a Department of Pediatrics, Center for the Advancement of Underserved Children, Medical College of Wisconsin, 8701 Watertown Plank Road, Milwaukee, WI 53226, USA;

^b Department of Pediatrics, Medical College of Wisconsin, Population Health Management, Children’s Hospital of Wisconsin, PO Box 1997, C525, Milwaukee, WI 53201-1997, USA

* Corresponding author.

E-mail address: vgunn@chw.org

Pediatr Clin N Am 62 (2015) 1313–1328
<http://dx.doi.org/10.1016/j.pcl.2015.06.004>

pediatric.theclinics.com

0031-3955/15/\$ – see front matter © 2015 Elsevier Inc. All rights reserved.

Abbreviations

CHR	Community Health Representative
CHW	Community Health Worker
FHW	Frontline Health Worker
LHW	Lay Health Worker
PN	Patient Navigator
PS	Promotoras

Knowledge of local health beliefs and practices can contribute to the development of culturally relevant health care service delivery. In addition, CHWs' perspectives regarding community-level assets and needs can inform the structure of responsive, patient- and community-centered medical homes.^{8,9}

Variation exists in the level and type of training that CHWs receive.¹⁰ Job titles and roles also differ across settings.¹¹ A 2002 integrative literature review reported evidence of CHW effectiveness in increasing access to care, particularly among underserved populations.¹² A more recent systematic review found mixed evidence demonstrating the impact of CHW interventions on behavior change and health outcomes and low to moderate strength of evidence regarding health care utilization. The authors concluded that more rigorous research is needed.¹³ A systematic review of lay health worker interventions in pediatric chronic disease concluded modest improvement in urgent care use, symptoms, and caregiver quality of life.¹⁴ No reviews were located that focused specifically on the comparative effectiveness of pediatric CHW interventions across ethnic groups or geographic settings. However, selected studies in the United States have reported that programs using some variation of a CHW increased public insurance enrollment and insurance continuity for Latino children,¹⁵ improved childcare knowledge among American Indian adolescent mothers,¹⁶ and demonstrated the potential to impact early caries prevention among American Indian and Alaska Native children.¹⁷ Improved breastfeeding initiation and exclusivity, childhood immunization rates, and pulmonary tuberculosis cure rates as compared with usual care have been reported in the international literature.¹⁸ Less convincing evidence for the impact of lay health worker interventions on child morbidity and increases in pediatric health care seeking behavior were reported.¹⁸ A qualitative review of barriers and facilitators to lay health worker program implementation found that trusting relationships between lay health workers and participants are a hallmark of program strength.¹⁹

HISTORICAL PERSPECTIVE

CHWs were recognized as critical to the success of the primary health care system by the World Health Organizations' Alma-Ata declaration in 1978. To achieve optimal population health, the declaration emphasized the importance of "bringing health care as close as possible to where people live and work."²⁰ Thus, investing in CHWs emerged as a key strategy. Although the initial implementation emphasis focused on low- to moderate-income countries, acknowledgment of the importance of CHWs in the primary health care system spread across the globe.

Before the formal recognition of Alma-Ata, CHWs served in a range of formal and informal caregiving roles, defined by local needs, culture, and law. Health promotion roles for natural helpers are traced back at least 300 years.²¹ In China, "barefoot doctors" were deployed to rural areas to improve health in the 1940s.²¹ In Mexico and Latin America, "*promotores de salud*" have provided health-related services for

decades. Importantly, other nations including Cuba and Iran have long invested in systems that link local health councils, CHWs and facility-based care.^{22,23}

Community Health Workers in the United States

Between 1966 and 2006, significant progress in CHW workforce development occurred in the United States.²¹ Initial community health work programs focused on addressing poverty, social problems, and their relationship to health. By the early 1970s, CHWs were used in short-term public and privately funded special projects, such as the Resource Mothers curriculum for CHWs developed by the Virginia Task Force on Infant Mortality.²¹ State and federal initiatives to incorporate CHWs emerged in the 1990s. In 1992, the Arizona Department of Health Services received state general funds to implement the Health Start Program, which continues to use CHWs to educate, support, and advocate for pregnant/postpartum women and their families.²⁴

By the end of the 1990s, state legislation calling for study of training standards and certification of CHWs was passed in Texas, followed by legislation authorizing a CHW certification program in Ohio in 2003.²¹ The Patient Navigator Outreach and Chronic Disease Prevention Act passed in 2005, codified a specific role for CHWs in the US health care delivery system.²⁵

The Patient Protection and Affordable Care Act (ACA) provides increased policy-level support for the community health workforce in the United States.²⁶ The law allows services provided by CHWs to be reimbursed by Medicaid under specific conditions; grant funding for CHWs through the ACA is earmarked for outreach to medically underserved communities, health behavior promotion, health insurance enrollment, home visitation for maternal and child health, and referral to health care and community-based resources.²⁷

TRAINING AND CERTIFICATION

Federal labor policy recognizes and tracks the CHW workforce. Duties are related broadly to outreach, support, informal counseling, and referral to improve health.²⁸ In 2013, the Bureau of Labor Statistics estimated that 45,800 individuals were employed as CHWs nationally. States with the highest employment level for the occupation included California, Texas, Illinois, New York, and Florida. The median hourly wage reported in 2013 was \$16.64, and CHWs were employed in a variety of settings including individual and family services, local government, and outpatient care centers. Some workforce studies estimate that between 25% and 35% of CHWs are volunteers, suggesting that a greater number of individuals function in this capacity.²⁹

Some states have legislated training and certification standards for CHW practice.¹⁰ Qualitative data reported by Kash and colleagues¹⁰ indicates that the impetus for CHW training and certification initiatives grew from recognition of unmet needs among cultural, economic, or geographic populations. Well-organized networks of CHWs are involved in advocacy for the profession, and for the people and communities they serve. Other states are less formalized. Training is offered via a variety of venues including community colleges, area health education centers, and workforce development agencies. Local nonprofit organizations and academic researchers also develop training specific to the health concern identified. Variation in criteria for selecting CHWs, and in the length and content of training impedes comparison of outcomes across studies.¹¹ O'Brien and colleagues¹¹ report that only 41% of intervention studies using CHWs described selection criteria for CHWs, and 59% included description of CHW training.

Debate regarding the benefits and potential negative impacts of formalized training and certification continues. Formalized training runs the risk of sapping CHWs of the interpersonal qualities that have been identified as necessary for success, such as empathy, warmth, nonjudgment, and acceptance. In health care professions, it is well-documented that as formal education proceeds future health care providers report declines in empathy over time.^{30,31} Exposure to the culture of medicine and development of an “insider” identity for CHWs may increase the potential for explicit and implicit bias toward marginalized social groups, despite shared identity. Provider bias can be a contributing factor to health care disparities.³² Thus, although integration of CHW as members of the health care team is recommended specifically as an important strategy to address health care disparities,³³ continued attention to the potential for unintended negative consequences of professionalization is warranted.

EVIDENCE OF EFFECTIVENESS

Facilitating Access to Health Care: Patient Navigators

Patient navigators (PN) help to facilitate successful progression through the health care delivery system, to achieve optimal outcomes.³⁴ Early PN interventions focused on reducing social disparities in cancer outcomes among adult women. Evidence for PN effectiveness with pediatric populations is emerging. Szilagyi and colleagues³⁵ reported increased preventive care visits and immunization rates among an urban adolescent, largely low-income population, using a PN intervention. Hambidge and colleagues³⁶ used master’s level PNs who lived in the predominantly Spanish-speaking urban community being served to deliver a tiered intervention aimed at increasing pediatric immunization and well-child visits. Improvements in public insurance enrollment and underimmunization in the first 15 months of life were achieved. Conversely, Schuster and colleagues³⁷ reported no improvement in well-child care visits for low-income African-American children using a case management/home visiting intervention. Of note, the case managers and home visitors were experienced, had college degrees or more, and were described as African American. They were trained and tasked to address barriers to access by providing health education and advocacy, but did not have direct access to resources within a health care system. The authors do not discuss interpersonal qualities related to trust building, which are often cited as critical for success in typical PN interventions.

Improving Health Care Quality and Outcomes by Community Health Workers

Well-child care redesign research indicates that adding nonmedical providers to the health care team has the potential to improve the experience and outcomes of low income-children and caregivers with developmental and behavioral concerns.³⁸ Farber³⁹ reported that incorporation into the well-child care of bilingual, college-educated parent coaches with specific training in parent-child interaction resulted in positive developmental outcomes. Brown and colleagues⁴⁰ provided brief communication training to bilingual, paraprofessional medical assistants to improve identification of mental health concerns in a pediatric primary care setting. Improvement in parents’ perceptions of care and willingness to discuss mental health concerns was reported. No studies specifically focused on CHWs addressing emotional and behavioral concerns in the pediatric primary care setting were located. However, Wissow and colleagues⁴¹ tested a common factors approach, which emphasized a range of relationship-based factors associated with child and adolescent mental health outcomes. Children of color randomized to pediatric primary care providers trained in these skills experienced significant decreases in impairment as measured by the

Strengths and Difficulties Questionnaire, a brief validated measure of emotional and behavioral problems in children. Of note, the common factors model specifically scopes a role for paraprofessionals. Recommendations related to practice organization highlight recruitment of “aides” from the community served by the practice. Although the authors do not use the CHW job title, the job description mirrors the responsibilities often associated with CHW roles. Key functions include “creating expectations about care, influencing the kinds of concerns for which patients seek help, and supporting patients in carrying out treatment recommendations.”⁴¹

Lessons learned from efforts to incorporate CHWs in the adult primary care setting can inform efforts to improve management of emotional and behavioral disorders in pediatric care. Waitzkin and colleagues⁴² tested a collaborative model of depression care, pairing *promotoras* who focused on social and contextual influences, with primary care providers. No significant differences between the *promotora*-enhanced intervention and control group were found. However, qualitative data indicated strong agreement across primary care physicians, administrators, and nonprofessional support staff regarding the value of the *promotoras*. Challenges to implementation of a clinic-based *promotora* intervention included identifying adequate space, primary care physician and *promotora* turnover, and balancing multiple workplace demands.⁴³

Stronger results from CHW interventions are reported for physical health outcomes. A 2009 systematic review by Postma and colleagues⁴⁴ of CHW interventions for children with asthma indicated consistent positive outcomes. In a sample of low-income, ethnically diverse pediatric patients, home-based asthma self-management delivered by CHWs combined with clinic-based nurse education resulted in better self-reported caretaker quality of life and more patient’s symptom-free days, compared with only clinic-based care.⁴⁵ Study authors concluded that CHWs were successful in promoting effective asthma-related behavior changes because trusting relationships with families built on shared experiences and community identity. Margellos-Anast and colleagues⁴⁶ also reported significant improvement in asthma control and caregiver quality of life resulting from a CHW health education intervention delivered to African-American children and caregivers living in low-income communities. Authors noted that selection criteria for CHWs emphasized the importance of having a “cultural connection” to the target communities, and passion for positively impacting the health of neighborhood residents. Prior disease specific experience or knowledge was not necessary.

Community Health Workers Enable Culturally Relevant Medical Care Through Patient-Centered Medical Homes and Accountable Care Organizations

CHWs who may share experiences, language, and culture can be well-equipped to help patient families (particularly those with complex conditions) coordinate care across health care delivery systems in patient-centric and culturally effective ways, critical attributes of the patient-centered medical home (PCMH).⁴⁷ Pediatric health systems now appreciate the benefits of a “medical home” for patients, and the ACA incentivizes the development of patient centered medical homes.⁴⁸ The Agency for Healthcare Research and Quality describes 5 attributes and functions of the PCMH: (1) comprehensive care, (2) patient centered, (3) coordinated, (4) accessible services, and (5) quality and safety.⁴⁹ The American Academy of Pediatrics promotes a slightly expanded definition of medical home for the pediatric population, which includes care that is accessible, continuous, comprehensive, patient- and family-centered, coordinated, compassionate, and culturally effective.⁵⁰ Each definition acknowledges the influence of myriad factors on health outcomes – including individual factors, the influence of family norms and behaviors, access to health systems, the influence of

communities, and larger societal and global influences – and the PCMH's role in facilitating health across all domains (Fig. 1).⁵¹ A population-based model of patient-centered care recognizes that physicians and patients each bring cultural experience and values into the care process. In many cases, the lived experience of providers and patients is vastly different. To facilitate the provision of comprehensive, patient-centered care that meaningfully engages patients in ways that respect their unique needs, culture, values, and family norms, PCMHs may effectively incorporate CHWs as a component of the care delivery team.⁴⁷

Financial Impact of Community Health Workers

The cost effectiveness of CHWs has been explored in many different settings including in the emergency department,⁵² and as extensions of primary care in the United States and abroad to increase access to care and manage chronic conditions.^{53–56} However, there are few studies assessing the cost effectiveness of CHWs serving a pediatric population in the United States. Many well-designed analyses of CHW programs for pediatric populations in the United States have focused on asthma-based interventions, and few of these included some cost analysis.^{57–60} A high-intensity, CHW-based intervention to decrease exposure to indoor asthma triggers in Seattle-King County projected a 4-year net savings of \$189 to \$721 per participant relative to a low-intensity group.⁵⁷ Study authors estimated that if the reductions in urgent care costs persisted among the high-intensity group, the potential savings per child could range from \$1316 to \$1849 discounted at 3% per year. Similarly, a crossover study of a

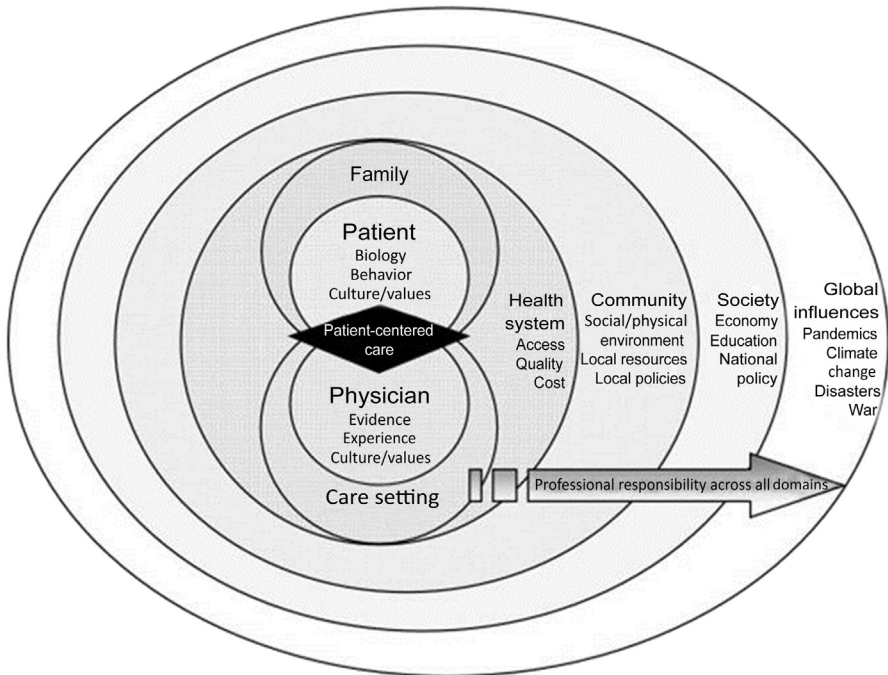


Fig. 1. Medical College of Wisconsin population-based model of a patient-centered care. (From Meurer LN, Young SA, Meurer JR, et al. The urban and community health pathway: preparing socially responsive physicians through community-engaged learning. *Am J Prev Med* 2011;41(453):S228–36; with permission.)

home-based environmental asthma management intervention delivered by lay health workers resulted in significant decreases in asthma-related emergency department visits and inpatient stays, at a relatively low per-family cost of \$450 to \$500.⁵⁸ A cost analysis of a community-based asthma management initiative in Boston showed an adjusted return on investment of 1.33 after controlling for changes in a comparison population, and a social return on investment of 1.85, which accounted for improvements in missed school and missed work days⁶⁰ (Box 1).

A community-based pediatric asthma initiative provided by outreach workers in Tacoma, Washington, resulted in significant improvements in caregiver quality of life, completed asthma management plans, and self-reported asthma hospitalizations. A formal cost-effectiveness analysis was not performed owing to the self-reported nature of health care utilization; however, study authors opined that – based on the estimated \$840 cost per hospitalization day (in 2002 dollars), and the average program cost of \$200 per family – the reported reduction in hospitalizations suggested that the intervention could decrease overall health care costs.⁵⁹ Although target populations for CHW-based interventions and outcome measures often differ, a systematic review of the economic value of home-based interventions to improve asthma morbidity concluded that the benefits of such programs – including interventions delivered by CHWs – exceeded the program costs.⁶²

CHALLENGES AND FUTURE MODELS

Expanded Scope from a Disease Focus to Include Social Influences on Health Outcomes

As insurers and consumers in the United States are beginning to hold health care delivery systems accountable for population-based outcomes, providers are exploring ways to address social influences on health outcomes. Public health data have long demonstrated that health-related behaviors and environmental, cultural, and social influences impact population health outcomes collectively more than the actual delivery of health care services^{63,64} (Fig. 2).

Box 1

Case study 1: Community health workers in community-based asthma management at Children's Hospital of Boston

Since 2005, the Community Asthma Initiative (CAI) of Boston Children's Hospital has used community health workers (CHWs), along with nurse case managers, to deploy a community-based asthma initiative to improve disease management.⁶⁰ CHWs conduct a series of home visits with enrolled children, educate families on asthma prevention and treatment (including identifying asthma triggers such as pests, dust, smoke, and mold), and provide demonstrations on how to reduce or eliminate exposure to specific triggers. CHWs provide families with supplies to address environmental triggers, such as pillow covers, plastic storage bins, and HEPA vacuum cleaners, and also facilitate family connection with local home inspectors to ensure that landlords address environmental hazards, such as leaking pipes or pests, which can exacerbate asthma. The CAI is a partnership between families of children with asthma, CHWs, primary care providers, schools, and community-based organizations to ensure that children with asthma receive the appropriate interventions to improve asthma outcomes. An evaluation of the CAI demonstrated significant decreases in asthma-related emergency department visits, hospitalizations, patient missed school days, parent missed work days, and limitations of physical activity owing to asthma.⁶¹

Data from Woods ER, Bhaumik U, Sommer SJ, et al. Community asthma initiative: evaluation of a quality improvement program for comprehensive asthma care. Pediatrics 2012;129(3):465–72.



Fig. 2. Determinants of health. CHW, community health worker. (Courtesy of Children's Hospital and Health System of Wisconsin, Milwaukee, WI; with permission; and Data from McGinnis JM, Williams-Russo P, Knickman JR. The case for more active policy attention to health promotion. *Health Aff (Millwood)* 2002;21(2):78-93.)

These findings are consistent with the population-based model of patient centered care, and the social ecological model of health. Each model acknowledges the influence of multiple determinants of health, including family norms and beliefs, community influences, and the influence of larger society. These factors are particularly relevant for a pediatric population that depends on adults to meet basic needs, and who typically learn health behaviors from influential adults.

As such, efforts to improve pediatric health outcomes must address the social determinants of health in culturally and socially acceptable ways.⁶⁴ Goepf and colleagues⁶⁵ uncovered powerful psychosocial factors driving low-acuity pediatric emergency department utilization using a participatory ethnographic research approach. CHWs were instrumental in identifying deterrents to primary care utilization that were previously misunderstood as willful abuse of the system. The incorporation of CHWs into a care delivery team may remove barriers to care that impede improvements in child health outcomes. The Community Rx program being piloted in Chicago links patients with an e-prescription for social support services in their community and a CHW who facilitates communication between the patient, community-based service, and clinic provider.⁶⁶ Although the CHW role in pediatric health service delivery has been focused historically on disease management, there may be an important role for CHWs to support development of caregiver skills to address social influences on health outcomes. Pediatric health systems investing in efforts to address the social determinants of health can consider training CHWs in individual-level capacity

building and change management techniques, such as motivational interviewing, to facilitate sustainable behavior change among pediatric patient families (Box 2).

Use of Community Health Workers as a Component of the Care Delivery Team

Efforts to formalize the use of CHWs to improve the continuity and coordination of care between health care delivery infrastructures (ie, between hospitals and primary care settings) have met with mixed success to date. Burns and colleagues⁷⁰ described a hospital-based quality improvement initiative that used in-person and telephonic support by CHWs to decrease readmission rates among an adult population at high risk of readmission. Although the intervention patients had lower readmission rates compared with usual care, there was no improvement in follow-up with a primary care provider among the intervention patients, and the decrease in readmissions did not attain significance. Importantly, the authors described several challenges to CHWs implementation of the improvement, including inconsistent notification of CHWs of an eligible patient before discharge and CHWs not having ready access to information regarding patient appointments. In contrast, the Camden Coalition of Healthcare Providers has effectively used CHWs as integral members of the care delivery team to facilitate understanding of chronic health conditions, support health

Box 2

Case study 2: Community health workers addressing social determinants of health outcomes as a component of primary care services at Children's Hospital of Wisconsin

Children's Hospital of Wisconsin uses community health navigators as part of a comprehensive, capacity-building initiative to improve the health of communities in which children live, learn, and grow. The navigators, trusted residents of the communities in which they work, use a strengths-based approach to caregiver skill building to enable caregivers to successfully address social influences on health outcomes. The models that inform navigator training include Prochaska's transtheoretical (Stages of Change) model,⁶⁷ social cognitive theory,⁶⁸ and the health belief model.⁶⁹ Lucy's story is illustrative of the way Children's Hospital of Wisconsin's navigators serve as a critical extension of the care delivery team whose focus on social determinants of health provides an important complement to the clinical services, and enables a comprehensive approach to health.

Lucy is an 8-year-old girl with a history of poorly controlled type I diabetes mellitus, who has been hospitalized multiple times for diabetic ketoacidosis. Lucy and her mother have worked with clinicians in the Children's Hospital Diabetes Clinic and with her Children's Medical Group primary care pediatrician to manage her disease. After several months of sporadically attended clinic appointments at which Lucy's blood sugar readings were frequently elevated, Lucy's pediatrician became concerned that Lucy's mother may have low health literacy, and engaged the community health navigator who serves Lucy's neighborhood. The navigator met Lucy and her mother at their residence, and learned that they were effectively homeless, moving from willing friend or family member as able, and squatting in abandoned buildings when they could not stay with friends. As a result, they were often without electricity. Insulin must be refrigerated to maintain its effectiveness, and Lucy often was without electricity (much less a refrigerator), making it impossible to manage her diabetes well. The community health navigator worked with Lucy's mother in a capacity-building manner, assessing her familiarity with housing resources and comfort in completing the application process, even engaging in role play to facilitate her readiness to change and to build her confidence in navigating the often intimidating process for securing housing and energy assistance utility relief. After working with the navigator, Lucy's mother was able to secure stable housing with appliances and utilities. In addition, the diabetes clinic staff, primary care provider, and community health navigator all worked collaboratively to support Lucy and her mother in effectively managing her diabetes.

behavior change, and keep patients connected with their primary care providers, reducing the need for higher acuity health care settings, and ultimately decreasing the total cost of care.⁷¹

Inclusion of CHWs as an integral member of a care delivery team requires buy-in from providers and staff alike for success, although not all health care professionals perceive the value of CHWs in improving health outcomes. Mobula and colleagues⁷² demonstrated that primary care providers and clinic staff with greater cultural competence, preparedness, and motivation were more likely to perceive CHWs as helpful in reducing health care disparities. Attention to building organizational cultural competency may be needed to successfully implement team-based care. Effectively leveraged, CHWs' knowledge of local assets and credibility within the community could facilitate an enhanced relationship among patients and provider care teams. This in turn, could foster greater provider appreciation for the relevance of CHWs, resulting in improvement of internal cultural competencies.

Practice Considerations

Health care systems will need to consider a variety of factors when incorporating CHWs in the care delivery team (**Box 3**). Roles among team members will need to be clarified, ensuring that all team members are enabled to practice at the top of their license or training (because CHWs are not always licensed). Discussions regarding scope of practice can often create tension among provider groups, and may be particularly challenging when incorporating nonlicensed team members into the care delivery continuum. Systems that acknowledge and appreciate the value of CHWs in effectively engaging patients and families in unique ways that are cost effective and result in improved outcomes will be willing to work through these difficult conversations. Sargeant and colleagues⁷³ describe 5 elements of interprofessional primary care teamwork related to effectiveness – understanding and respect of roles, awareness that team building requires effort, understanding primary care principles, practical “know how,” and communication. Findings from Solheim and colleagues⁷⁴ emphasize that effective primary health care practice requires attentiveness to community complexity, and the capacity to integrate perspectives from individuals and families. CHWs are a logical conduit for bidirectional flow of information to and from the health care delivery system. When CHWs are incorporated into a care delivery team to enable local and authentic means of supporting patient families in community and home-based health improvement, providers should recognize that differences in vernacular and style of engagement may exist. Misunderstanding and distrust among the care delivery team can occur. Clear role definition, frequent opportunities for collaboration, training in cultural humility,⁷⁵ and development of operational structures

Box 3

Practice considerations for integrating community health workers

- Create culture supportive of community health workers (CHW) role in care delivery team.
- Define CHW role (eg, health education, access, clinical support, etc) and associated workflow adjustments among care team.
- Determine training required for CHWs.
- Establish metrics of CHW effectiveness.
- Develop mechanism for CHW documentation in the electronic health record.
- Implement mechanism to bill for CHW services.

to facilitate information exchange and validation will be instrumental in developing an effective care continuum.

An important enabler to meaningfully use CHWs as members of a care delivery team is developing means of including CHW documentation in the electronic health record. Because US health care delivery systems historically were not established to manage population health, electronic health records have not typically been designed to document social determinants of health and the interventions used by health care systems to address them.⁷⁶ Documentation in the medical record helps to ensure clear communication among care delivery team members, and may be necessary to secure reimbursement for CHWs service. However, practical, ethical, and legal considerations regarding documentation in the medical record require careful attention. Despite these challenges, some systems have enabled CHWs to effectively leverage their EHRs to meet patient needs and document progress toward goals. The Heart of TX Community Health Center has enabled CHWs to use reports from their electronic health record to recall diabetic patients due for examinations.⁷⁷ The Children's Hospital of Wisconsin's employed CHWs receive referrals from primary care providers, school nurses, inpatient providers, and other colleagues within the system, and are working to formalize this referral process in the electronic health record (Gunn VL, personal communication, January 12, 2015). Other barriers to integrating CHWs into the care delivery team include lack of clarity in mechanisms for reimbursement for services, and lack of metrics to measure CHW contribution to improving health outcomes, enhancing the quality of care and decreasing the total cost of care.⁷⁸

Outcomes from policy- and systems-level approaches implemented in Massachusetts are beginning to emerge; early signs of success related to sustaining the CHW workforce through recognition, training, and funding are reported.⁷⁹ Texas advanced Medicaid policy to formally include CHWs as members of the health care team. Minnesota has established a comprehensive infrastructure, and enacted policy that allows Medicaid reimbursement for CHWs who complete certification and serve under approved supervisory staff in the primary care setting.⁸⁰ Several other states have enacted policy relative to CHW scope of practice, training, and certification.¹⁰ Health care systems and providers can benefit from lessons learned thus far, and proceed with more informed implementation. Continued attention to recruitment, training, and supervision criteria is warranted to achieve improved health outcomes and cost effectiveness. Consideration of potential roles for CHWs along the prevention and health promotion continuum may complement the contributions that CHWs make to chronic disease management. The CHW workforce in pediatric patient-centered medical homes could be used to promote physical activity, fresh fruit and vegetable consumption, literacy, and positive parenting skills, among other strategies to positively impact the health of the population.

SUMMARY

CHWs are increasingly recognized as key to local and national efforts aimed at reducing health care disparities and advancing health equity. For decades, CHWs have been important components of health care service delivery to vulnerable and underserved populations throughout the world. CHWs have demonstrated ability to improve access to health care, facilitate care coordination, and support improved health outcomes; and have shown a reduction in health care costs and increases in quality of living. Recent federal policies clarifying reimbursable services by CHWs and the development of several evidence-based CHW interventions to improve pediatric health outcomes create a favorable environment for pediatric systems to

thoughtfully incorporate CHWs into the health care continuum. Continued rigorous research demonstrating reduction in health care disparities and improved health outcomes is warranted.

REFERENCES

1. American Public Health Association. Community Health Workers. In: American Public Health Association. 2014. Available at: <http://www.apha.org/apha-communities/member-sections/community-health-workers>. Accessed January 18, 2015.
2. Haines A, Sanders D, Lehmann U, et al. Achieving child survival goals: potential contribution of community health workers. *Lancet* 2007;369:2121–31.
3. Love MB, Gardner K, Legion V. Community health workers: who they are and what they do. *Health Educ Behav* 1997;24(4):510–22.
4. Brownstein JN, Hirsch GR, Rosenthal EL, et al. Community health workers “101” for primary care providers and other stakeholders in health care systems. *J Ambul Care Manage* 2011;34(3):210–20.
5. Charles-Azure J, Lette E. Promotion of healthier beverages in Indian communities. *IHS Prim Care Provid* 2005;30:143–7.
6. McGill J. What can one program do? Energy drinks regulated in Montana thanks to efforts of Blackfeet CHRs. In: Indian Health Service. n.d. Available at: <http://www.ihs.gov/chr/index.cfm?module=oneProgram>. Accessed January 2, 2015.
7. Arredondo E, Mueller K, Mejia E, et al. Advocating for environmental changes to increase access to parks: engaging promotoras and youth leaders. *Health Promot Pract* 2013;14(5):759–66.
8. Findley S, Matos S, Hicks A, et al. Community health worker integration into the health care team accomplishes the triple aim in a patient-centered medical home: a Bronx tale. *J Ambul Care Manage* 2014;37(1):82–91.
9. Wennerstrom A, Bui T, Harden-Barrios J, et al. Integrating community health workers into a patient-centered medical home to support disease self-management among Vietnamese Americans: lessons learned. *Health Promot Pract* 2015;16(1):72–83.
10. Kash BA, May ML, Tai-Seale M. Community health worker training and certification programs in the United States: findings from a national survey. *Health Policy* 2007;80(1):32–42.
11. O'Brien MJ, Squires AP, Bixby RA, et al. Role development of community health workers: an examination of selection and training processes in the intervention literature. *Am J Prev Med* 2009;37(6S1):S262–9.
12. Swider SM. Outcome effectiveness of community health workers: an integrative literature review. *Public Health Nurs* 2002;19(1):11–20.
13. Viswanathan M, Kraschnewski JL, Nishikawa B, et al. Outcomes and costs of community health worker interventions: a systematic review. *Med Care* 2010;48(9):792–808.
14. Raphael JL, Rueda A, Lion KC, et al. The role of lay health workers in pediatric chronic disease: a systematic review. *Acad Pediatr* 2013;13(5):408–20.
15. Flores G, Abreu M, Chaisson CE, et al. A randomized, controlled trial of the effectiveness of community-based case management in insuring uninsured Latino children. *Pediatrics* 2005;116(6):1433–41.
16. Barlow A, Varipatis-Baker E, Speakman K, et al. Home-visiting intervention to improve child care among American Indian adolescent mothers: a randomized trial. *Arch Pediatr Adolesc Med* 2006;160(11):1101–7.
17. Albino JE, Orlando VA. Promising directions for caries prevention with American Indian and Alaska Native children. *Int Dent J* 2010;60(3S2):216–22.

18. Lewin S, Munabi-Babigumira S, Glenton C, et al. Lay health workers in primary and community health care for maternal and child health and the management of infectious diseases. *Cochrane Database Syst Rev* 2010;(3):CD004015.
19. Glenton C, Colvin CJ, Carlsen B, et al. Barriers and facilitators to the implementation of lay health worker programmes to improve access to maternal and child health: qualitative evidence synthesis. *Cochrane Database Syst Rev* 2013;(10):CD010414.
20. World Health Organization. Declaration of Alma-Ata International Conference on Primary Health Care, Alma-Ata, USSR, 6–12 September 1978. In: *Primary Health Care*. 2008. Available at: http://www.who.int/publications/almaata_declaration_en.pdf?ua=1. Accessed January 26, 2015.
21. U.S. Department of Health and Human Services. Community Health Worker National Workforce Study. In: Health Resources and Services Administration, Bureau of Health Professions. 2007. Available at: <http://bhpr.hrsa.gov/healthworkforce/reports/chwstudy2007.pdf>. Accessed December 3, 2014.
22. Drain PK, Barry M. Global health: 50 years of U.S. embargo: Cuba's health consequences and lessons. *Science* 2010;328(5978):572–3.
23. Javanparast S, Baum F, Labonte R, et al. The experience of community health workers training in Iran: a qualitative study. *BMC Health Serv Res* 2012;12:291.
24. Arizona Department of Health Services. Health Start Program. In: Office of Women's Health. Available at: <http://www.azdhs.gov/phs/owch/women/healthstart.htm>. Accessed January 21, 2015.
25. U.S. Government Publishing Office. Public Law 109-18-Patient Navigator Outreach and Chronic Disease Prevention Act of 2005. In: *Public and Private Laws*. 109th Congress. H.R. 1812. 2005. Available at: <http://www.gpo.gov/fdsys/pkg/PLAW-109publ18/pdf/PLAW-109publ18.pdf>. Accessed January 26, 2015.
26. U.S. Government Publishing Office. Public Law 111-148-Patient Protection and Affordable Care Act. In: *Public and Private Laws*. 111th Congress. H.R. 3590. 2010. Available at: <http://www.gpo.gov/fdsys/pkg/PLAW-111publ148/pdf/PLAW-111publ148.pdf>. Accessed January 26, 2015.
27. Islam N, Nadkarni SK, Zahn D, et al. Integrating community health workers within patient protection and Affordable Care Act implementation. *J Public Health Manag Pract* 2015;21(1):42–50.
28. United States Department of Labor. Occupational employment and wages, May 2013: 21–1094 Community Health Workers. In: Bureau of Labor Statistics. 2014. Available at: <http://www.bls.gov/oes/current/oes211094.htm>. Accessed January 21, 2015.
29. Rosenthal EL, Wiggins N, Ingram M, et al. Community health workers then and now: an overview of national studies aimed at defining the field. *J Ambul Care Manage* 2011;34(3):247–59.
30. Bellini LM, Shea JA. Mood change and empathy decline persist during three years of internal medicine training. *Acad Med* 2005;80(2):164–7.
31. Hojat M, Mangione S, Nasca TJ, et al. An empirical study of decline in empathy in medical school. *Med Educ* 2004;38(9):934–41.
32. Institute of Medicine. *Unequal treatment: confronting racial and ethnic disparities in health care*. Washington, DC: The National Academies Press; 2003.
33. Ingram M, Reinschmidt KM, Schachter KA, et al. Establishing a professional profile of community health workers: results from a national study of roles, activities and training. *J Community Health* 2012;37(2):529–37.
34. Freeman HP, Rodriguez RL. History and principles of patient navigation. *Cancer* 2011;117:3537–40.

35. Szilagyi PG, Humiston SG, Gallivan S, et al. Effectiveness of a citywide patient immunization navigator program on improving adolescent immunizations and preventive care visit rates. *Arch Pediatr Adolesc Med* 2011;165(6):547–53.
36. Hambidge SJ, Phibbs SL, Chandramouli V, et al. A stepped intervention increases well-child care and immunization rates in a disadvantaged population. *Pediatrics* 2009;124(2):455–64.
37. Schuster MA, Wood DL, Duan N, et al. Utilization of well-child care services for African-American infants in a low-income community: results of a randomized, controlled case management/home visitation intervention. *Pediatrics* 1998; 101(6):999–1005.
38. Coker TR, Windon A, Moreno C, et al. Well-child care clinical practice redesign for young children: a systematic review of strategies and tools. *Pediatrics* 2013;131(S1):S5–25.
39. Farber ML. Parent mentoring and child anticipatory guidance with Latino and African American families. *Health Soc Work* 2009;34(3):179–89.
40. Brown JD, Wissow LS, Cook BL, et al. Mental health communications skills training for medical assistants in pediatric primary care. *J Behav Health Serv Res* 2013;40(1):20–35.
41. Wissow LS, Gadomski A, Roter D, et al. Improving child and parent mental health in primary care: a cluster-randomized trial of communication skills training. *Pediatrics* 2008;121(2):266–75.
42. Waitzkin H, Getrich C, Heying S, et al. Promotoras as mental health practitioners in primary care: a multi-method study of an intervention to address contextual sources of depression. *J Community Health* 2001;36(2):316–31.
43. Getrich C, Heying S, Willging C, et al. An ethnography of clinic “noise” in a community-based, promotora-centered mental health intervention. *Soc Sci Med* 2007;65(2):319–30.
44. Postma J, Karr C, Kieckhefer G. Community health workers and environmental interventions for children with asthma: a systematic review. *J Asthma* 2009;46(6):564–76.
45. Krieger J, Takaro TK, Song L, et al. A randomized controlled trial of asthma self-management support comparing clinic-based nurses and in-home community health workers: the Seattle-King County Healthy Homes II Project. *Arch Pediatr Adolesc Med* 2009;163(2):141–9.
46. Margellos-Anast H, Gutierrez MA, Whitman S. Improving asthma management among African American children via a community health worker model: findings from a Chicago-based pilot intervention. *J Asthma* 2012;49(4):380–9.
47. Martinez J, Ro M, Villa NW, et al. Transforming the delivery of care in the post-health reform era: what role will community health workers play? *Am J Public Health* 2011;101(12):e1–5.
48. Patient Centered Primary Care Collaborative. Joint Principles of the Patient-Centered Medical Home. 2007. Available at: <http://www.pccpc.net/joint-principles>. Accessed December 8, 2014.
49. U.S. Department of Health and Human Services. Defining the Patient Centered Medical Home. In: Agency for Healthcare Research and Quality. n.d. Available at: <http://pcmh.ahrq.gov/page/defining-pcmh>. Accessed December 8, 2014.
50. American Academy of Pediatrics. Family-Centered Medical Home Overview. In: National Center for Medical Home Implementation. n.d. Available at: http://medicalhomeinfo.org/about/medical_home/. Accessed December 8, 2014.
51. Meurer LN, Young SA, Meurer JR, et al. The urban and community health pathway: preparing socially responsive physicians through community-engaged learning. *Am J Prev Med* 2011;41(4S3):S228–36.

52. Enard KR, Ganelin DM. Reducing preventable emergency department utilization and costs by using community health workers as patient navigators. *J Healthc Manag* 2013;58(6):412–28.
53. Whitley EM, Everhart RM, Wright RA. Measuring return on investment for outreach by community health workers. *J Health Care Poor Underserved* 2006; 17(1 Suppl):6–15.
54. Gilmer TP, Rose S, Valentine WJ, et al. Cost-effectiveness of diabetes care management for low-income populations. *Health Serv Res* 2007;42(5):1943–59.
55. Prinja S, Jeet G, Verma R, et al. Economic analysis of delivering primary health care services through community health workers in 3 North Indian states. *PLoS One* 2014;9(3):e91781.
56. Gaziano TA, Bertram M, Tollman SM, et al. Hypertension education and adherence in South Africa: a cost-effectiveness analysis of community health workers. *BMC Public Health* 2014;14:240.
57. Krieger JW, Takaro TK, Song L, et al. The Seattle-King County Healthy Homes Project: a randomized, controlled trial of a community health worker intervention to decrease exposure to indoor asthma triggers. *Am J Public Health* 2005;95(4): 652–9.
58. Bryant-Stephens T, Kurian C, Guo R, et al. Impact of a household environmental intervention delivered by lay health workers on asthma symptom control in urban, disadvantaged children with asthma. *Am J Public Health* 2009;99(S3): S657–65.
59. Primomo J, Johnston S, DiBiase F, et al. Evaluation of a community-based outreach worker program for children with asthma. *Public Health Nurs* 2006; 23(3):234–41.
60. Bhaumik U, Norris K, Charron G, et al. A cost analysis for a community-based case management intervention program for pediatric asthma. *J Asthma* 2013; 50(3):310–7.
61. Woods ER, Bhaumik U, Sommer SJ, et al. Community asthma initiative: evaluation of a quality improvement program for comprehensive asthma care. *Pediatrics* 2012;129(3):465–72.
62. Nurmagambetov TA, Barnett SB, Jacob V, et al. Economic value of home-based, multi-trigger, multicomponent interventions with an environmental focus for reducing asthma morbidity: a community guide systematic review. *Am J Prev Med* 2011;41(2S1):S33–47.
63. McGinnis JM, Foege WH. Actual causes of death in the United States. *JAMA* 1993;270(18):2207–12.
64. McGinnis JM, Williams-Russo P, Knickman JR. The case for more active policy attention to health promotion. *Health Aff (Millwood)* 2002;21(2):78–93.
65. Goepf JG, Chin NP, Massad J, et al. Pediatric emergency department outreach: solving medical problems or revealing community solutions? *J Health Care Poor Underserved* 2004;15(4):522–9.
66. Parekh A. Clinical-community linkages: a step towards better health. In: U.S. Department of Health and Human Services. 2013. Available at: [http://obgyn.bsd.uchicago.edu/FacultyResearch/Lindaulab/hhs%20blog%20post%20\(2\).pdf](http://obgyn.bsd.uchicago.edu/FacultyResearch/Lindaulab/hhs%20blog%20post%20(2).pdf). Accessed January 17, 2015.
67. Prochaska JO. Systems of psychotherapy: a transtheoretical analysis. 2nd edition. Pacific Grove (CA): Brooks-Cole; 1984 (Originally published 1979).
68. Bandura A. Social learning theory. Englewood Cliffs (NJ): Prentice Hall; 1977.
69. Rosenstock IM, Strecher VJ, Becker MH. Social Learning Theory and the Health Belief Model. *Health Educ Q* 1988;15(2):175–83.

70. Burns ME, Galbraith AA, Ross-Degnan D, et al. Feasibility and evaluation of a pilot community health worker intervention to reduce hospital readmissions. *Int J Qual Health Care* 2014;26(4):358–65.
71. Gawande A. The hot spotters. In: *The New Yorker*. 2011. Available at: <http://www.newyorker.com/magazine/2011/01/24/the-hot-spotters>. Accessed January 18, 2015.
72. Mobula LM, Okoye MT, Boulware LE, et al. Cultural competence and perceptions of community health workers' effectiveness for reducing health care disparities. *J Prim Care Community Health* 2015;6(1):10–5.
73. Sargeant J, Loney E, Murphy G. Effective interpersonal teams: “contact is not enough” to build a team. *J Contin Educ Health Prof* 2008;28(4):228–34.
74. Solheim K, McElmurry BJ, Kim MJ. Multidisciplinary teamwork in US primary health care. *Soc Sci Med* 2007;65(3):622–34.
75. Tervalon M, Murray-Garcia J. Cultural humility versus cultural competence: a critical distinction in definition physician training outcomes in multicultural education. *J Health Care Poor Underserved* 1998;9(2):117–25.
76. Phalen J, Paradis R. How Community health workers can reinvent health care delivery in the US. In: *Health Affairs Blog*. 2015. Available at: <http://healthaffairs.org/blog/2015/01/16/how-community-health-workers-can-reinvent-health-care-delivery-in-the-us/>. Accessed January 18, 2015.
77. Gard AM, FNP-BC. Anatomy of implementation: the structural framework for meaningful use of electronic health records. In: *National Health Care for the Homeless Council*. 2012. Available at: <http://www.nhchc.org/wp-content/uploads/2012/01/Anatomy-of-Implementation-The-Structural-Framework-for-MU-of-EHR.pdf>. Accessed January 17, 2015.
78. California Health Workforce Alliance. Taking innovation to scale: community health workers, promotores, and the triple aim. In: *California Health and Human Services Agency*. 2013. Available at: [http://www.chhs.ca.gov/PRI/_Taking%20Innovation%20to%20Scale%20-%20CHWs,%20Promotores%20and%20the%20Triple%20Aim%20-%20CHWA%20Report%2012-22-13%20\(1\).pdf](http://www.chhs.ca.gov/PRI/_Taking%20Innovation%20to%20Scale%20-%20CHWs,%20Promotores%20and%20the%20Triple%20Aim%20-%20CHWA%20Report%2012-22-13%20(1).pdf). Accessed January 19, 2015.
79. U.S. Department of Health and Human Services. State legislation supports professional development of community health workers, leading to greater professional recognition, enhancements in training, and funding. In: *Agency for Healthcare Research and Quality*. 2013. Available at: <https://innovations.ahrq.gov/profiles/state-legislation-supports-professional-development-community-health-workers-leading>. Accessed January 21, 2015.
80. Rosenthal EL, Brownstein JN, Rush CH, et al. Community health workers: part of the solution. *Health Aff (Millwood)* 2010;29(7):1338–42.