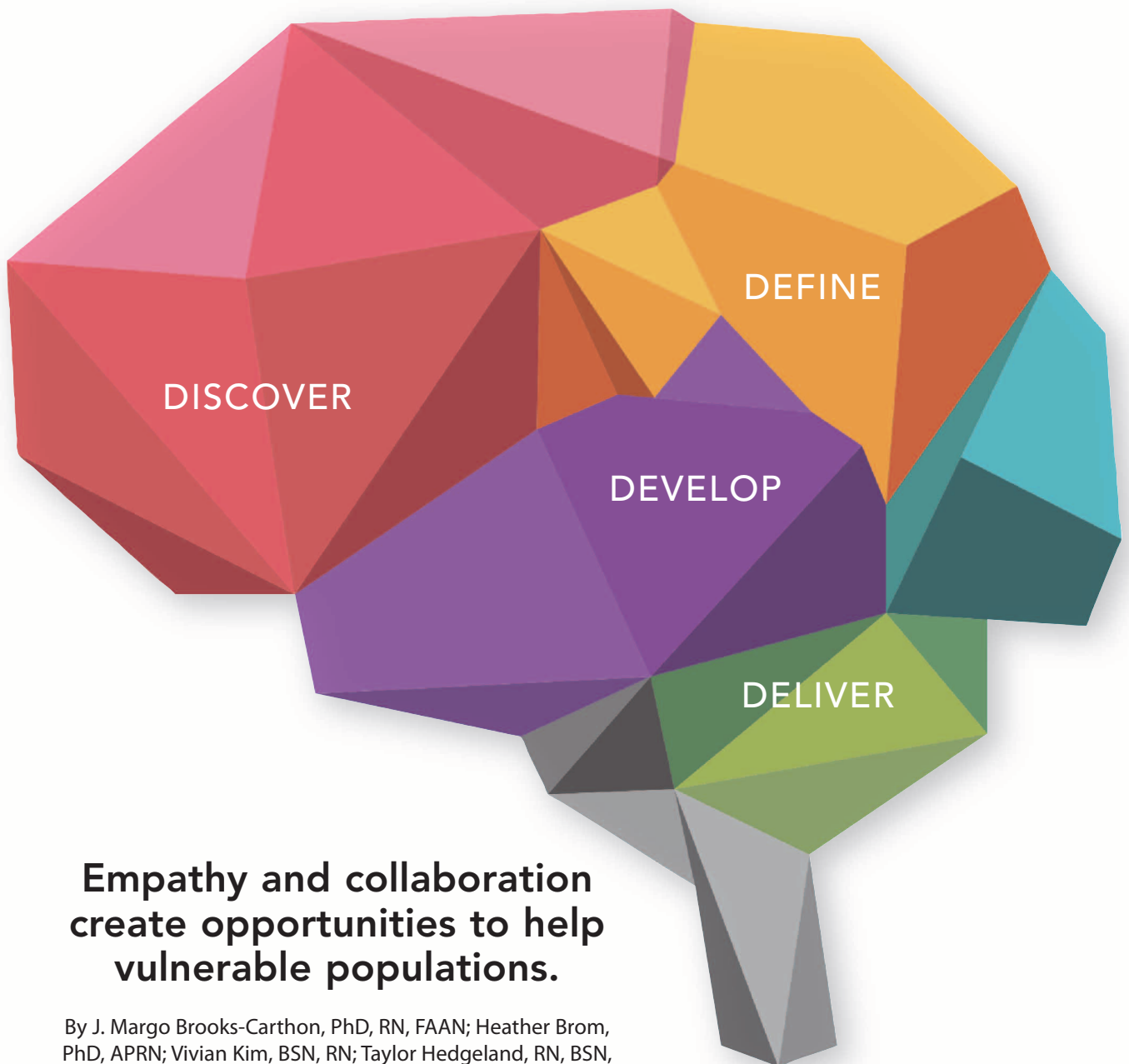


How innovation and **design thinking** can improve care



**Empathy and collaboration
create opportunities to help
vulnerable populations.**

By J. Margo Brooks-Carthon, PhD, RN, FAAN; Heather Brom, PhD, APRN; Vivian Kim, BSN, RN; Taylor Hedgeland, RN, BSN, CNOR; Eileen Ponietowicz, RN, BSN; and Pamela Cacchione, PhD, CRNP, BC, FGGSA, FAAN

DESPITE NATIONAL EFFORTS to reduce health-care disparities, medically complex and socially at-risk patients continue to experience relatively poor outcomes during and after hospitalization, including frequent readmissions and preventable emergency department (ED) visits. (See *Who's socially at risk?*) Many organizations have developed programs (such as comprehensive wraparound services, community health workers, or chronic disease case managers) to address these needs, but results have been mixed. Design thinking—a problem-solving tool that emphasizes empathy with end-users, interdisciplinary collaboration, and rapid-cycle solution testing—can be used by nurses and other healthcare providers to help socially at risk patients.

Design thinking, also known as “human-centered design” or “user-centered design,” is driven by the needs of the targeted population. Traditionally, it’s been used in engineering and business as a framework for developing services and products, but healthcare systems have adopted it to tackle the growing complexities caused by social, financial, and political pressures.

In this article, we describe how we used design thinking as a framework to develop the THRIVE clinical pathway to improve care transitions for hospitalized patients who are socially at risk.

Our experience with design thinking

Our use of design thinking began in January 2018 when we formed an academic–clinical partnership between the University of Pennsylvania School of Nursing and Penn Presbyterian Medical Center in Philadelphia. Our team is led by a nurse researcher and includes physicians, social workers, clinical nurses, community health workers, and home care professionals. Our project received quality improvement internal review board approval from the University of Pennsylvania.

We used the design thinking Double Diamond model as the framework for developing our new clinical pathway. The model uses four phases with corresponding divergent (discover and define) and convergent thinking (develop and deliver). (See *The Double Diamond model*.)

Phase 1: Discover

Because our healthcare system cares for a di-



Who's socially at risk?

The National Academy of Sciences, Engineering, and Medicine commissioned the *System Practices for Care of Socially At-Risk Populations* report, which defines socially at-risk individuals as those who

- have low socioeconomic status
- are socially isolated
- have low health literacy
- reside in disadvantaged neighborhoods
- identify as racial, ethnic, or gender minorities.

verse urban patient population, we needed to begin by understanding the healthcare challenges socially at-risk patients face when they return home after hospitalization. We also needed to evaluate the resources currently in place within the hospital to prepare patients for the transition home.

In this first phase, we immersed ourselves in the healthcare system and the community. Over 6 weeks, we conducted over 80 hours of clinical interviews, 30 inpatient and outpatient observations, and 44 stakeholder informal interviews and observations that covered eight units in the hospital.

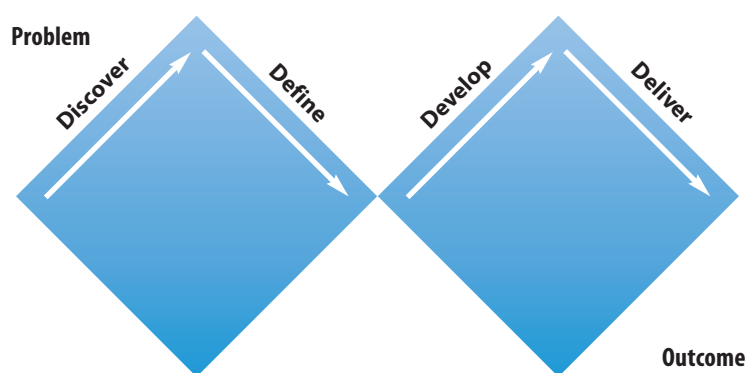
We learned about the challenges (including low health literacy, underprepared caregivers, limited transportation, and a lack of primary care providers) patients face after discharge that prevent optimal recovery. For example, during a meeting with a patient in his home, we learned that he had a follow-up appointment scheduled, but it would take up to 90 minutes one way to get there and required several forms of public transportation. This patient's functional status alone was a barrier; he appeared too weak to walk to the corner store, much less undertake a 3-hour round-trip trek. We also found that many patients live in unstable housing conditions, with variable family support and few material re-

The Double Diamond model

The Double Diamond model, frequently used as a visual representation of design thinking, illustrates four phases.

- **Discover phase**—insight and information are collected from the perspective of the population of interest.
- **Define phase**—insight and information are synthesized and problems are identified.
- **Develop phase**—multiple directions are explored in a collaborative effort to find a potential solution; prototypes are brainstormed for testing.
- **Deliver phase**—rapid, low-cost experiments are performed to test solutions.

The knowledge gained from the experiments converges into a final solution that can be scaled or expanded to other settings. Many projects proceed through each phase of the design thinking process, but they're not meant to be followed linearly. Design thinking encourages users to move freely between phases.



Adapted from the Design Councils Framework for Innovation.

sources. Leaving the confines of the hospital and entering the homes of recently discharged patients allowed us to clearly visualize the barriers to optimal recovery.

In the hospital setting, we found considerable variation in how socially at-risk patients were managed across units. Communication between inpatient and outpatient care providers was limited, and providers reported little time to form strong relationships with patients because of the complex nature of their medical care and competing demands.

During this phase, we were particularly interested in the perceptions of frontline care providers. In six focus groups with hospital nurses, we learned that they had no difficulty identifying patients who are socially at risk. However, they addressed these concerns inconsistently, citing time constraints and high workloads as the primary barriers.

Phase 2: Define

Next, the team sought to determine which specific problems caused the most difficulty

with recovery after discharge and warranted the most attention. This phase required the team to define the problem from the point of view of our diverse stakeholders, ranging from patients to caregivers in the community and hospital setting. To accomplish this, we took part in several group activities, including mapping the patient journey from admission to discharge and identifying “extreme users,” such as those with multiple hospitalizations over a short period. We also used the electronic health record (EHR) to examine the characteristics of patients who experienced adverse events, such as 30-day readmissions. We found that patients insured by Medicaid who had multiple medical conditions and high social needs (for example, those who lived in a high-poverty zip code) had increased rates of readmissions.

Phase 3: Develop

During this phase, the team brainstormed potential solutions for developing a process to meet the needs of the targeted population. Leveraging our findings from the contextual inquiry, nurse focus groups, and EHR data, we agreed on inclusion criteria (individuals insured by Medicaid [proxy for low income] and with more than two chronic medical conditions) for clinical pathway participation and discussed several strategies to improve care. The value of the brainstorming sessions can't be overstated. All ideas, creativity, and out-of-the-box thinking were encouraged.

Phase 4: Deliver

During the deliver phase we began rapid-cycle testing THRIVE, the proposed clinical systems innovation. The team settled on the name THRIVE because of our shared commitment that all patients should experience optimal recovery after discharge despite their social circumstances. THRIVE begins by enrolling eligible hospitalized patients who are identified through an EHR review by nurse case managers. Once identified, participants are enrolled and receive enhanced discharge support, including a home care referral and postdischarge supervision by a discharging physician until the patient sees their primary care provider.

The clinical pathway was tested in multiple rapid-cycles, divided into 2 weeks of implementation separated by 2 weeks of iterations. These blocks of testing were repeated, and in

some cases the team returned to an earlier phase of the design thinking process to further refine the intervention until a final solution was formed.

Early success and lessons learned

Since its inception, the THRIVE clinical pathway has enrolled 264 patients and involved over 50 hospital and community-based health-care providers. Participating patients have experienced reduced readmissions and ED visits and increased primary care and specialty care follow-up.

One challenge we've faced is the variability of referral patterns. In the first 18 months, 209 patients were enrolled, averaging 12 patients per month. This enrollment was well below our pre-implementation estimate of 50 patients per month. To address these concerns, our team automated the referral process between the hospital and home care services to optimize patient identification and facilitate referrals. In the past 6 months, with the introduction of automation, the average referrals have increased to over 29 patients per month.

We also learned the importance of getting buy-in from healthcare system leadership and administration. Involving leadership from conception to implementation helped us develop measures of success that are important to patients and the healthcare system.

Design thinking and nurses

Design thinking allowed us to create a platform to positively influence the health of socially at-risk patients. Our team is interdisciplinary, but it prominently features nurses in leadership and care delivery roles. With their training and expertise in critical thinking and clinical judgement, nurses are natural problem solvers. Integrating frontline care providers, who have intimate knowledge of provider workflow and patient needs, allowed us to immediately course correct when needed. Innovation and design thinking support nurses who want to address problems they face at the bedside by using creative, patient-centered approaches.

AN

J. Margo Brooks-Carthon is the Tyson Family Term Chair in Gerontological Research and associate professor at the University of Pennsylvania School of Nursing, Center for Health Outcomes and Policy Research in Philadelphia. **Heather Brom** is an assistant professor at Villanova University. **M. Louise Fitzpatrick** College of Nursing in Vil-

lanova, Pennsylvania. **Vivian Kim** is a research assistant at the Center for Health Outcomes and Policy Research. **Taylor Hedgeland** is an operating room nurse manager, general surgery services, at Penn Presbyterian Medical Center in Philadelphia. **Eileen Ponietowicz** is a clinical resource management team lead at Penn Presbyterian Medical Center. **Pamela Cacchione** is the Ralston House Endowed Term Chair in Gerontological Nursing and associate professor of geropsychiatric nursing at the University of Pennsylvania School of Nursing and clinical educator nurse scientist at Penn Presbyterian Medical Center.

References

- Altman M, Huang TTK, Breland JY. Design thinking in health care. *Prev Chronic Dis*. 2018;15:180128. doi:10.5888/pcd15.180128
- Brom H, Brooks Carthon JM, Ikeaba U, Chittams J. Leveraging electronic health records and machine learning to tailor nursing care for patients at high risk for readmissions. *J Nurs Care Quality*. 2020;35(1):27-33. doi:10.1097/NCQ.0000000000000412
- Brooks-Carthon JM, Lasater KB, Rearden J, Holland S, Sloane DM. Unmet nursing care linked to rehospitalizations among older Black AMI patients: A cross-sectional study of US hospitals. *Med Care*. 2016;54(5):457-65. doi:10.1097/MLR.0000000000000519
- Brooks Carthon JM, Hedgeland T, Brom H, Hounshell D, Cacchione PZ. "You only have time for so much in 12 hours" unmet social needs of hospitalised patients: A qualitative study of acute Care Nurse. *J Clin Nurs*. 2019; 28(19-20): 3529-37. doi:10.1111/jocn.14944
- Design Council. What is the framework for innovation? Design Council's evolved Double Diamond. designcouncil.org.uk/news-opinion/what-framework-innovation-design-councils-evolved-double-diamond
- Eines TF, Vatne S. Nurses and nurse assistants' experiences with using a design thinking approach to innovation in a nursing home. *J Nurs Manag*. 2018;26(4):425-31. doi:10.1111/jonm.12559
- Ferreira FK, Song EH, Gomes H, Garcia EB, Ferreira LM. New mindset in scientific method in the health field: Design Thinking. *Clinics*. 2015;70(12):770-2. doi:10.6061/clinics/2015(12)01
- Feuerwerker S, Rankin N, Wohler B, Gemino H, Risler Z. Improving patient satisfaction by using design thinking: Patient advocate role in the emergency department. *Cureus*. 2019;11(1):e3872. doi:10.7759/cureus.3872
- Finkelstein A, Zhou A, Taubman S, Doyle J. Health care hotspotting—A randomized, controlled trial. *N Engl J Med*. 2020;382(2):152-62. doi:10.1056/NEJMs1906848
- Institute of Medicine Committee on Quality of Health Care in America. *Crossing the Quality Chasm: A New Health System for the 21st Century*. Washington, DC: National Academies Press; 2001.
- Rahemi Z, D'Avolio D, Dunphy LM, Rivera A. Shifting management in healthcare: An integrative review of design thinking. *Nurs Manage*. 2018;49(12):30-7. doi:10.1097/01.NUMA.0000547834.95083.e9
- Yates P. Design thinking: Can it enhance nursing research? *Cancer Nurs*. 2018;41(4):344-5. doi:10.1097/NCC.0000000000000630