

Original Research

Implementation of a Geriatric Patient-Centered Medical Home: the Geriatric Patient – Aligned Care Team (*GeriPACT*)

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Abstract

Background: A Veterans Health Administration (VHA) patient centered medical home, the Geriatric Patient- Aligned Care Team (*GeriPACT*).

Methods: Plan-Do-Study-Act (PDSA) cycles regarding strategy, resource development, patient and caregiver experience of care, and clinical care process improvement. Stakeholder engagement for half-time operation with initial grant support for personnel who also had collateral duties. Tracking of operations data.

Results: The clinic population grew from 200 to 627 over a 7-year period. *GeriPACT* patients were frail with multiple co-morbidities, including a mean age 84, a 19.4% yearly hospitalization rate, and 12.2% died yearly. Collaborative team management of these complex patients reduced mean number of outpatient medications from 11 to 9, and the 30-day rehospitalization rate was 10%, approximately half the facility's rate. Estimated yearly



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cost avoidance for *Ger iPACT* was \$1,963,243. Implementation of *Ger iPACT* is impacted by limited availability of trained providers.

Conclusions: *Ger iPACT* may be a cost-effective way to manage high-risk, high-need elderly patients. *Ger iPACT* expansion and implementation in all facilities has been made part of the VHA regional strategic plan.

Keywords

Implementation; medical model; patient-centered medical home

1. Background

The patient centered medical home (PCMH) model is being implemented by a growing number of health organizations in order to provide improved population health management: more comprehensive, coordinated, and patient-centered care [1]. The PCMH model includes team-based care focused on enhanced access and coordination. Published evaluations of the PCMH model in both large healthcare systems and individual practices have shown mixed results, with some studies demonstrating small positive effects on patient experiences and small to moderate positive effects on health care delivery [2-4]. In 2010 the Veterans Health Administration (VHA) implemented the PCMH model (Patient-Aligned Care Teams – PACT) in all primary care clinics, encompassing a population of 5 million veterans [5]. A 3-year implementation experience with PACT demonstrated a 3.0 staff per 1.0 primary care provider (PCP) ratio, a 20% reduction in return visits increasing new patient capacity, and a 10-fold increase in telephone care [6]. Over 50% of veterans receiving primary care are over age 65, with veterans over age 85 representing the fastest growing subpopulation. These older veterans represent some of the most cognitively and physically disabled high-risk, high-need patients of the VA patient population. The VA has supported a broad array of home and community-based services including both medical and personal care programs, to support the mission of the VHA Office of Geriatrics and Extended Care (GEC): access, balance, and coordination of care [7]. *Ger iPACT* is an integral component of this initiative, a special population PACT initiated in 2011 for complex geriatric and other high-risk vulnerable veterans, providing integrated, interdisciplinary assessment and longitudinal management and coordination of both VA and non-VA services for patients and caregivers [8, 9]. Little research has been done on the effectiveness of the PCMH for older adults, though there have been numerous proposed benefits [10].

2. Context and Development of the *Ger iPACT* Model

The Tennessee Valley Healthcare System (TVHS) consists of two campuses, Nashville and Murfreesboro, and is located in Veterans Integrated Service Area (VISN) 9 in Southeast US. The Tennessee Valley Healthcare System (TVHS) is an integrated health care system in middle Tennessee comprised of 2 medical centers located 40 miles apart, and 12 community-based outpatient clinics. TVHS provides ambulatory care, primary care, a full range of specialized medical services in acute medicine and surgery, as well as a full range of extended care and mental

health services. The patient population includes over 98,000 individuals of which approximately 97% are paneled in primary care. A market analysis showed that the Nashville campus of TVHS had a census of over 1000 patients greater than age 80, 35% of whom were rural or highly rural. The wait list for geriatric primary care was greater than 60 veterans, and the clinic also received many requests for geriatric evaluations, as well as falls and dementia consults. *GeriPACT* was developed from a small geriatric evaluation and management clinic that had been operating for 20 years, sharing space through a cooperative arrangement with the neurology and psychiatry outpatient clinics. VA transformational grant funding was available starting in 2011 for four years to cover 50% of the cost of increased staffing, and was essential in obtaining leadership approval to initiate *GeriPACT* at the Nashville campus [11, 12].

The *GeriPACT* team consists of the *GeriPACT* provider (a 1 FTEE geriatrician or geriatric nurse practitioner with an outpatient panel size goal of approximately 800), social worker, clinical pharmacist, registered nurse care manager, licensed practical nurse, and medical clerical support assistant (all 1 FTEE staff). Additional staff including clinical psychologists and dietitians were shared with other primary care teams and consulted on a case-by-case basis. All providers were experienced in working as a coordinated unit delivering patient-centered assessments and managing medically complex and vulnerable elderly individuals (**Figure 1**). Patients and caregivers received frequent communications from the *GeriPACT* team, including contact when patients were hospitalized and following patient discharge from hospital and long-term care facilities.

We provide an evaluation of our innovative 7-year (2011-2018) *GeriPACT* regional experience with this team based care model, with reference to a framework for implementation research.

Geriatric Patient-Centered Medical Home

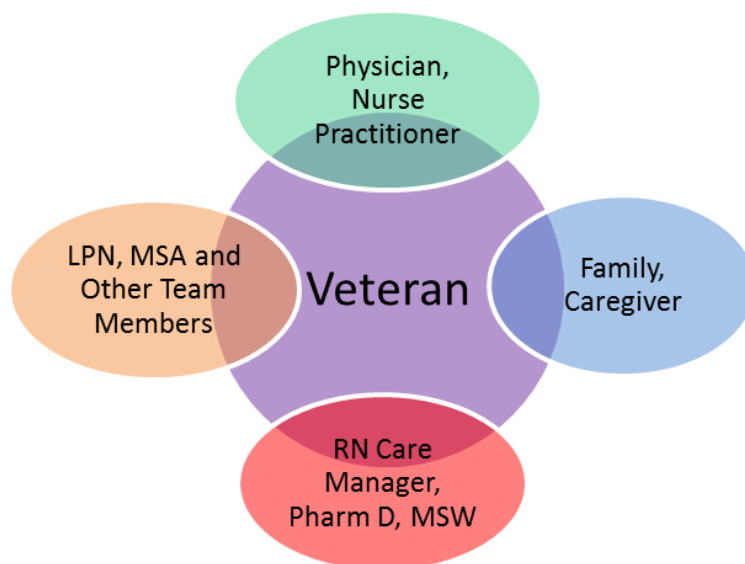


Figure 1 Structure of the PCMH concept as used in *GeriPACT*. Patients and their families/caregivers interact with a team of providers, including physicians, nurse practitioners, nurse care managers, social workers, licensed practical nurse (LPN), clinical pharmacists, medical support assistants (MSA), and other staff, all of whom work as a coordinated unit. Other staff including clinical psychologists and dietitians were shared with other primary care teams and consulted on a case-by-case basis.

3. Methods and Process Improvement Implementation of the Model

Planning for *Ger iPACT* began in 2010 with meetings of potential stakeholders and supporters which included primary care physicians, the Chief of Staff, and Chiefs of Social Work and Pharmacy. Frequent quality improvement Plan-Do-Study-Act (PDSA) cycles regarding strategy, resource development, patient experience of care, and clinical care process improvement were performed. These exercises helped to identify key operational steps to enable full implementation of the PCMH. Three major attributes of the PCMH framed the PDSA cycles: access (same-day appointments, shared medical appointments, and non-appointment care), care management and coordination (focus on personalized care for high-risk high-need patients, chronic disease management, improved transitions between levels of care, and caregiver support), and practice redesign (defining team member roles, communication, and improved processes of work for visit as well as non-visit work). Analyzing the results and refining the change led to additional PDSA cycles. An initial interdisciplinary teamlet [13] was identified, consisting of the physician, registered nurse care manager care manager, licensed practical nurse, clinical pharmacist, social worker, and nurse practitioner. *Ger iPACT* replaced an existing geriatric clinic that formerly cared for a primary care population of 200 older veterans. The team met with primary care providers at the facility to discuss referral processes, and population metrics were reviewed to identify potential patients to be invited to *Ger iPACT*, including patients with age greater than 80, poor functional status, and advanced disease processes.

A strategy to obtain support and administrative buy-in for a part-time clinic was aided by VA transformational funding for a portion of the increased staffing essential to PCMH function. All clinic personnel had collateral duties and the physician director covered messages and patient care needs between clinic sessions. Not every patient needed to see each team member at every visit. The team became skilled in providing just-in-time (real-time, as needed) interdisciplinary consultation with colleagues engaged with individual patients. Frequent team meetings helped to develop interdisciplinary team function, facilitated workflow, and identify resource needs.

Operations data was reviewed during team meetings and utilized as a vehicle to promote quality improvement activities impacting the patient experience of care including caregiver support, waiting times, development of electronic consult protocols, and electronic health record (EHR) documentation.

Ger iPACT operations data, consisting of population health and outcome metrics, were tracked utilizing the Veterans Information System Health and Technology Architecture (VISTA), as well as EHR provider panel management tools. Metrics tracked included patient age, numbers of medications, major diagnoses, hospitalizations, deaths, and clinic panel size. Data was collected continually during the development and implementation of the model, and summary statistics were conducted on an annual basis.

The Tennessee Valley Healthcare System Institutional Review Board determined this project as a quality improvement initiative.

4. Results

4.1 Outcome Data

Our GeriPACT panel proved to be a high-risk, high-need population with multiple comorbidities, as anticipated [9]. The mean patient age of the panel was 84 years, with 30 % having diabetes, 15% dementia and 12% congestive heart failure in addition to multiple other medical comorbidities, and an average 12% yearly mortality. Over the first four years of implementation, the GeriPACT team reduced yearly hospitalizations from 21% to 13% (mean 19%), the mean number of outpatient medications per patient fell from 11 to 9, and the 30-day all cause readmission averaged 10% for this population of older adults (**Table 1**).

Table 1 GeriPACT Data (mean 2011-2016)

Population N=627

Mean Age	84
Mean # outpatient medications	8.7
Diagnoses CHF	11.6%
DM	29.8%
ASCVD	28%
Dementia	14.6%
Admitted	19.4%
30-day rehospitalization	10%
Expired	12.2%

Cost avoidance/year
 Rehospitalization \$132,403*
 Medication reduction \$1,830,840**
 \$1,963,243

*[compared to facility 30-day readmission 20%, 4.5 day hospitalization @ \$10,885[14]]

**[mean reduction 2 medications/patient, \$4/day cost avoidance per medication[15]]

Abbreviations: CHF (congestive heart failure), DM (diabetes mellitus), ASCVD (Atherosclerotic Cardiovascular Disease)

4.2 Successful Practices

Group appointments are scheduled so that patients can be seen by the physician as well as the pharmacist and/or social worker on the same day as needed. Additionally, the clinical pharmacist sees patients independently, focusing on polypharmacy and chronic disease (diabetes, hypertension, and chronic lung disease) medication management. The social worker also sees caregivers independently at times and responds to consultations concerning eligibility and obtainment of community-based services. The RN care coordinator utilizes the EHR dashboard (a snapshot of the patient panel providing current status, location, and pertinent clinical reminders) to identify and refer high-risk patients, including those with post-discharge acute care sensitive

conditions, recent hospital and post-acute care discharges, and anticoagulation management needs.

4.3 Example of a group appointment

One of the clinic's favorite patients is a 106 year-old veteran who still lives in his own apartment, albeit with the frequent assistance of his 86-year-old daughter. On clinic appointment days, he is seen immediately on arrival with a thorough assessment of his health maintenance needs by the licensed practical nurse, who also addresses all relevant clinical reminders in the VA EHR. The pharmacist performs a medication reconciliation, providing instruction and answering all questions posed by the patient and caregiver. The social worker assesses for any community-based care needs and for caregiver burden, utilizing a shared decision making process with discussion of available community resources. All team members communicate with the physician who examines the patient, provides advice and recommendations, and makes appropriate changes and referrals in the EHR. With each visit this centenarian obtains a teamlet consultation designed to maximize his person-centered care, providing access to a rich variety of skilled and nonskilled services, and assisting with caregiver burden.

4.4 Model Success Leads to Dissemination

The successful implementation of *GeriPACT* provided a helpful example in the early development of primary care PACT at our facility. VISN leadership became aware of *GeriPACT* outcomes and subsequently required *GeriPACT* development as part of the 2015 strategic plan at all regional facilities. The following year regional leadership further provided first year funding of approximately \$3.5 million for all six facilities in the VISN 9 region to locally develop and fully implement the *GeriPACT* model throughout the region.

4.5 Barriers Along the Way

The TVHS *GeriPACT* clinic currently operates at 75% capacity. Provider recruitment and achievement of full staffing has been challenging, despite the cost effectiveness of the clinic based on cost avoidance methodology. Staff turnover is particularly challenging to maintaining optimal team function. Recruitment of providers and release of team members from collateral duties, including pharmacist coverage of medical specialties and social worker management of walk-in consultations, remain substantial barriers to implementation pending attainment of full workload. There continues to be efforts to fully staff *Geri-PACT* at all facilities in the region, with most clinics having achieved approximately 50% capacity over a 2– year period. Recruitment of trained providers, allocation of staffing with release from collateral duties, and achieving workload requirements during partial implementation remain challenges at all VISN 9 regional facilities.

5. Discussion and Implications

The *GeriPACT* model may be a value-added means to manage frail elderly patients, contributing to cost avoidance and improved patient outcomes. The clinic at the TVHS Nashville campus, functioning at approximately 75% capacity, realized an estimated \$1,963,243 annual cost avoidance for the facility. We estimate that an enlarged *GeriPACT* capacity could realize even

greater cost savings, based on economies of scale. Key initial cost avoidance domains include decreased outpatient medication and 30-day re-hospitalization rates. Several elements of transitional care described in literature as best practices can be found in the *GeriPACT* model: prompt post-discharge outpatient follow-up, open communication between providers, medication reconciliation and patient and/or caregiver education [16]. Furthermore, a team-based approach to transitional care is especially important for reducing readmissions, especially for the highest risk patients [17, 18]. The *GeriPACT* model helps to ensure that relevant hospital records are obtained, medication changes are reviewed, and outpatient appointments are scheduled promptly to minimize wait times. Messaging systems are also available to patients, and post-discharge provider-patient communication is clear and comprehensive, resulting in best-possible transitions of care for vulnerable and high-risk patients [19-21]. While others have found lower utilization of inpatient and emergency services [2], and improved quality indicators [3] with the PCMH, detailed evaluation of long-term outcomes and downstream effects on healthcare utilization patterns remain ongoing endeavors at our facility.

Process improvement and transformational change takes time and requires organizational investment. The consolidated framework work for implementation research [22] suggests five elements of evaluation: intervention characteristics including core and adaptable components, outer setting consisting of external factors such as economic, political, or social contexts, inner setting consisting of the structure’s networks culture and readiness of the organization, participant characteristics including targeting users and other stakeholders who may be affected by the process of change, and the implementation process itself consisting of planned formal and informal activities, and intended and unintended actions to bring about change. In the development of *GeriPACT* at our facility, the interventions were data-driven and responded to input from key stakeholders including patients, clinicians, and administrators. Continued communication with stakeholders was crucial in providing continued support for the creation of *GeriPACT*. Implementation of *GeriPACT* occurred in the setting of an evolving VA primary care PCMH directive and with availability of partial grant support to offset staffing costs of the new clinic, in recognition of the large number of high-risk high-need elderly and their caregivers. The clinic was slowly expanded from a small existing clinic, utilizing collaborative staff and frequent team meetings to review quality and performance metrics (**Table 2**).

Table 2 Consolidated Framework for Implementation of *GeriPACT*. Includes core interventional characteristics, outer setting (external factors), inner setting (readiness of organizational structure), participant characteristic (stakeholders) and planned activities of the implementation process.

Constructs	Model Demonstration
Intervention characteristics	Data-driven, constant stakeholder involvement
Outer setting	VA Primary Care PACT directive
Inner setting	Large number of high-risk, high-need elderly
Participant characteristics	Collaborative pilot practice
Implementation process	PDSA cycles, partial funding support

Limitations: Recruitment of trained providers and allocation of staffing during partial implementation are challenges to *GeriPACT* development, especially given the national shortage of primary care and geriatric trained physicians [23-25], and full development of these clinics takes time. While medication reduction and reduced hospitalization are notable achievements of the model, we know little about other long-term benefits to the health system. The PCMH model was implemented in a non-fee-for-service system which placed a priority on cost avoidance, and thus the proposed staffing pattern inherent in the PCMH model may prove challenging for other payer systems in the private sector.

Replication and Future Plans: The *GeriPACT* operation involves a collaborative effort of many healthcare professionals. Risk assessment to identify high-risk high-need older patient populations being seen in other primary care and disease specific clinics for appropriate inclusion in *GeriPACT*, assisting colleagues with goals of care discussions, and expansion of model remain priorities. New EHR dashboard applications displaying specific *GeriPACT* panel comorbidities may be a helpful resource. *GeriPACT* personnel may also serve as effective resources for further support of high-risk, high-need elderly patient populations including consultation for dementia and caregiver support, and telehealth outreach for rural populations.

The high rate of multi-morbidity and mortality among these patients make *GeriPACT* an appropriate venue to expand primary palliative care services. The *GeriPACT* model is now being actively promoted nationally within the VA system, with evidence of adaptation to local context including variations in structural characteristics including staffing, allocation of clinical space, panel size, patient enrollment procedures, patient conditions managed, clinical services provided, and team composition. Future evaluation measures that are important in the development of the geriatric PCMH model includes further characterization of organizational contextual factors, staffing components, team function, provider satisfaction, patient and caregiver needs and satisfaction, patient reported outcomes, tracking of care transitions, and other performance and health outcomes metrics.

Author Contributions

Powers: Concept, design, analysis, interpretation, preparation of paperwork; Moseley, Buckner: Concept, design, preparation of paper; Xie, Abraham, Azubike: Preparation of paper.

Competing Interests

The authors have declared that no competing interests exist.

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