

Original Research

Use of a Clinically Derived Risk Calculator to Assess Advance Care Planning for Elderly Veterans in the Outpatient Setting

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ABSTRACT

Background

Only a third of Americans have completed an advance directive, however completion of advance directives helps to protect patient autonomy and promotes engagement and discussion of goals of care. Primary care physicians have the ability to longitudinally engage patients in effective conversations about their wishes toward end-of-life care. Electronic health record (EHR) tools can help clinicians to identify high-risk patients appropriate for advance care planning (ACP). Over 60% of deaths are out of hospital deaths.

Methods

We utilized the care assessment of need (CAN), an electronic medical record (EMR) dashboard tool available for all primary care patients treated at the Department of Veterans Affairs, to risk-stratify the 101,000 Tennessee Valley Healthcare System patient population. Patients identified as highest-risk individuals appropriate for ACP were assessed for completion of advance directives.

Results

For patients with a score of CAN-99 (12-month probability of hospitalization or death=44.8%), N=341, 63.6% had documented advance directives. Some 13.8% of CAN-99 patients received palliative care consults with 77% of these delivered during an inpatient stay. Another 10.5% of CAN-99 patients expired within 6 months and 39% of these received palliative care consults. Patients enrolled in the geriatric patient centered medical home (GeripACT) were more likely to receive a palliative care consult (33% versus 12%, $p<0.001$) and to have completed advance directives compared to patients paneled in primary care (80% versus 58%, $p<0.05$).

Conclusion

A clinically derived risk calculator can identify patients appropriate for ACP. High-risk patients enrolled in a geriatric clinic have a higher likelihood of palliative care consultation and ACP completion. A minority of ACP for these high-risk patients is performed in the outpatient department, suggesting an opportunity to expand ACP for high-risk patients in the outpatient setting.

Keywords

Advance care planning (ACP); Clinical risk calculator; Elderly veterans.

BACKGROUND

Geriatric patients consume a disproportionate share of healthcare resources. Estimates from the US suggest that 50% of healthcare costs are attributed to 5% of the general population characterized as high-risk, high-need patients.¹ This high-risk, high-need population is characterized by heavy healthcare utilization and significant functional self-care limitations. In addition to clinical needs, this population also has behavioral, functional, and social needs.² Thus, creation of programs aimed at adding services for this population, thereby focusing service resources to needs, makes enormous sense. One area for improvement would be risk stratifying patients for appropriate outpatient palliative care services in order to promote advance care planning (ACP) and enhance goals of care discussions and patient-centered care.

Developing an advance directive enhances patient-centered care, protects patient autonomy, and helps prepares loved ones to assist in healthcare decisions when the patient cannot. The recording and sharing of these ACP documents with families and others is essential for allowing patients to have the opportunity to make informed decisions about their own end-of-life care and to ultimately receive care that is consistent with their individual values.

ACP documents include: 1) a living will, also called an advance healthcare directive or plan, which indicates care preferences, 2) appointment of a healthcare agent, which includes the medical power of attorney entrusted to make medical decisions when the patient is no longer able to, and 3) the portable directive or medical order which provides documentation to all healthcare providers and emergency personnel regarding the patient's wishes, regarding resuscitation and intubation. ACP documents help family members make healthcare decisions when the patient cannot. Ideally advance directives for future care should be completed before critical illness, and can be reviewed and updated, if desired, at any time.

Context and Development of Clinical Risk Stratification

The innovative Care Assessment of Need (CAN) is a highly reliable clinical, non-claims – based predictor of future hospitalization and death developed for VA populations.^{3,4} Prediction models using electronic clinical data accurately identify patients with elevated risk for hospitalization or death, using the Primary Care Management Module in the Veterans Health Administration (VHA) Corporate Data Warehouse.⁵ This methodology extracts electronic clinical data predictors from 6 categories: social demographics, medical conditions, vital signs, prior year use of health services, medications, and laboratory tests and then constructs multinomial logistic regression models to accurately predict outcomes for over 4,600,000 patients. This information can inform coordination of care for patients with complex clinical conditions. CAN scores are available for all VHA primary care patients. We utilized the CAN scores to identify high-risk veterans appropriate for ACP to assess completion of advance directives.

METHODS**Healthcare System Description**

The Tennessee Valley Healthcare System (TVHS) is an integrated healthcare 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 101,000 individuals of which approximately 97% are paneled in primary care.

In 2011, TVHS developed a geriatric patient-centered medical home model for geriatric primary care – the Geriatric Patient-Aligned Care Team (*GerPACT*).⁶ The *GerPACT* Team consists of the *GerPACT* provider (geriatrician or geriatric nurse practitioner with an outpatient panel size of approximately 800), a social worker, a clinical pharmacist, a registered nurse care manager, a licensed vocational nurse, and clerical staff. These individuals are experienced in working as a coordinated unit delivering patient-centered assessments and managing medically complex and vulnerable elderly individuals. *GerPACT* is a special population PACT within primary care for complex geriatric and other high-risk vulnerable veterans providing integrated, interdisciplinary assessment and longitudinal management, and coordination of both VA sponsored and non-VA sponsored (Medicare and Medicaid) services for patients and caregivers.⁷

Data

From a total of N=101,000 patients seen at the TVHS, N=341 patients had a score of CAN-99 (12-month probability of hospitalization or death=44.8% at 1 year). This identified the highest-risk patients. Chart review for all CAN-99 patients was performed to assess age, major diagnoses, 6-month follow-up for death, the presence of palliative care consultation, completion of advance directives, and enrollment in *GerPACT*.

Analysis

Descriptive and comparison (Chi square) statistics were computed. A level of $p < 0.05$ was accepted for the level of significance.

Our overall study was designed to meet SQUIRE (Standards for Quality Improvement Reporting Excellence) criteria,⁸ and this report meets the Quality Improvement Minimum Quality Criteria Set domains for reporting quality improvement work.⁹

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

RESULTS

The high risk population with scores of CAN-99, N=341, representing 0.4% of the TVHS population, had a mean age of 71

and revealed high morbidity. Major diagnoses encountered in this population included: congestive heart failure (51.1%), ischemic heart disease (52.2%), stroke (12.6%), chronic renal failure 34.9%, diabetes mellitus (54.3%), chronic pulmonary disease (42.2%), depression (43.1%), and dementia (15.9%). Patients received an average 5.7 primary care visits, 8.2 emergency room visits, and 4.8 hospitalizations yearly and they had a 6-month mortality rate of 10.5% (Table 1).

Table 1. CAN 99 Population	
N	341
Mean age (years)	71.2
Probability of event	44.8%
6-mos mortality	36 (10.5%)
Hosp (mean/yr)	1646 (4.8)
Advance Directive completed	217 (63.6%)
Pall Care Consult	47 (13.8%)
Primary Care visits (mean/yr)	1923 (5.7)
CHF	173 (51.1%)
IHD	178 (52.2%)
CVA	43 (12.6%)
CRF	119 (34.9%)
DM	185 (54.3%)
COPD	144 (42.2%)
Dementia	54 (15.9%)
Depression	147 (43.1%)
Probability of event (death or hospitalization in 1 year), (Pall Care) Palliative Care consult present in electronic medical record, (ED) Emergency Department- number of visits in the last 12 months, (Hosp) hospitalized in the previous 12 months, primary care visits in the previous 12-months, CHF congestive heart failure, IHD ischemic heart disease, CVA stroke, CRF chronic renal insufficiency, DM diabetes mellitus, COPD chronic lung disease.	

Review of the CAN-99 population showed 63.9% had advance directives completed. Only 13.8% of these high-risk patients received a palliative care consult. The majority of consults 77%, were performed on inpatients and 23% in outpatient settings. A total of 96% of patients receiving palliative care consults completed advance directives compared to 58% of CAN-99 patients not receiving a palliative care consult ($p < 0.001$). Patients that expired were not more likely to receive palliative care consults (39% versus 61%, $p < 0.001$), however, patients enrolled in GeriPACT were more likely to receive a palliative care consult (33% versus 12%, $p < 0.001$), and to have completed advance directives (80% versus 58%, $p < 0.05$) compared to patients paneled in primary care. GeriPACT patients comprised 9.5% of the CAN-99 population. Death rates at 6-months were similar for CAN-99 patients enrolled in both GeriPACT and primary care panels.

Among patients completing advance directives, 78% completed both the appointment of agent as well as an advance healthcare directive, while 9.6% completed the appointment of

agent and 11.9% completed advance healthcare directive forms alone. The mean age of patients completing advance directives was 71.4 while those not completing advance directives had a mean age of 66.5. There was no difference in mean age or presence of palliative care consult between completion of both appointment of agent and advance healthcare directive or completion of either document alone. CAN-99 patients receiving palliative care consults were more likely to die within 6-months compared with those not receiving palliative care consults (29% versus 7%, $p < 0.001$).

DISCUSSION

A clinically derived risk calculator can identify patients appropriate for ACP. Primary care providers appear to do a good job of providing advance care planning for these high-risk individuals, with 63.9% of patients having completed advance care planning forms in the EMR, almost twice the 36.7% estimated prevalence in the general population.¹⁰ High-risk patients enrolled in GeriPACT have an 80% likelihood of ACP completion, and those receiving palliative care consultation achieve a 96% completion rate. Social workers may also help to increase the prevalence of advance care plan documentation as they discuss advance directives in both the inpatient and outpatient settings. The VA advance directive packet provided to patients includes both appointment of agent as well as the advance healthcare directive forms.

Providers may have identified some patients among this high-risk population more likely to die and requested palliative care consultation. Approximately 75% of VA hospital deaths¹¹ received a palliative care consult, but nationally over 60% of deaths are out of hospital deaths, and this proportion is increasing.¹² In-hospital consults provide an opportunity to do symptom management as well as goals of care discussions. The high prevalence of out-of-hospital deaths suggests there is an opportunity to improve outpatient ACP and palliative care consultation.

Multiple routes to improve outpatient advanced directive completion and ACP discussions may be possible. Training and encouraging providers to perform goals of care discussions and facilitating staff reminders increases ACP discussions by up to 50% with a much smaller increase in advance directive document completion (11-50% of those having ACP discussions) in the outpatient setting.¹³⁻¹⁵ Another possible model may be to enroll the highest-risk patients into GeriPACT, which has resources to perform consultations and outreach, including collaboration with Palliative Care and video conferencing to affiliated community-based clinics as well as in patient homes for enhanced family and caregiver support. Video decision support for goals of care discussions among dementia patients in the nursing home has been shown to improve advance directive completion from a baseline of 61.9% to 70%,¹⁶ and enhances palliative care consultation for rural populations.¹⁷

GeriPACT could be expanded to assume care of the highest-risk patients. CAN scores could be used to identify the highest resource utilizers. Considering the THVS population with

CAN scores 90 and above (N=2942), CAN-99 represents 11.5% of this population, but represented 41.9% of the palliative care consults, 21.6% of emergency room visits and 32.7% of hospitalizations. Incorporating the entire TVHS CAN-90 population within GeriPACT would populate approximately 4 GeriPACT clinics. However, CAN is only one possible risk stratification classification. Other dashboards are under development, including a specialized GeriPACT dashboard,^{18,19} which includes the JEN Frailty Index (JFI) derived from claims-based data on 13 impairment categories and 1800 diagnoses associated with long-term care.²⁰

Risk stratification tools may eventually guide panel development for intensified management of the highest risk patient populations, including resource utilization as well as ACP. Detailed sorting of high CAN-score patients utilizing indicators such as age or use of non-institutional care (NIC) services may also facilitate assessment for inclusion in high-risk management. For CAN-90 TVHS patients, there are N=88 who are aged 90-years or older, N=475 80-years or older, N=746 75-years or older, N=212 with dementia, N=138 receiving telehealth for chronic disease management, and N=112 who received palliative care consultations. Other veterans potentially at high-risk include those treated in the past 12-months aged 65-years or older with JFI scores between 3 and 5 and CAN scores greater than or equal to 75. The TVHS population of CAN-75 and above numbers 7629, equivalent to 9 GeriPACT clinics.¹¹ The literature on the benefits of high-risk management however is limited, suggesting no increased overall costs using claims-based data.²¹ Dashboards may also be used to reclassify patients with improved status no longer appropriate for high-risk management and who may be appropriate to transition back to primary care.

LIMITATIONS

Not all deaths may be reported, especially if they occur at a non-VA facility. High CAN score patients are hospitalized frequently, with higher likelihood that inpatient palliative care consults and social worker discussion of advance directives occur. The effect of palliative care consultation and advance directive completion on subsequent resource utilization is uncertain.

CONCLUSIONS

A clinically-derived risk calculator can identify patients appropriate for ACP. High-risk patients enrolled in a geriatric clinic have a higher likelihood of palliative care consultation and ACP completion. A minority of ACP for these high-risk patients is performed in the outpatient setting, suggesting an opportunity to expand ACP for high-risk patients in the outpatient setting.

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The authors report no conflicts of interest.

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