Precision Palliative Care as a Pragmatic Solution for a Care Delivery Problem

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ASCO and National Comprehensive Cancer Network guidelines recommend all patients with advanced cancer receive *early* palliative care (PC), within 8 weeks of diagnosis,[1,2] on the basis of evidence that concurrent care improves patient symptoms, mood and quality of life (QOL), caregiver distress, and quality of care at the end of life.[3] Unfortunately, guidelines ignore the reality that demand for PC outweighs the supply of specialists,[4] and the evidence that not all patients have supportive care needs at the time of diagnosis.[5] Key opinion leaders have instead advocated for timely PC on the basis of patient needs.[6-8] The Symptom Screening with Targeted Early Palliative care (STEP) trial demonstrated proof of concept: using systemic assessment, the research team was able to identify who benefited from timely PC, and who did not demonstrate any PC need.[9] Checklists, on the basis of patient symptoms or risk,[10] and electronic health record (EHR) prediction models,[11] have also successfully triggered timely PC referral. These studies force us to reimagine the current resource-intensive standard of *early* PC. We propose adoption of precision PC, a pragmatic approach that captures heterogeneous, time-varying, and complex patient/caregiver needs, while considering limited human and system resources.

Deficiencies of the *Early* PC Model

Consider the cases of Terrell, James, and Rachel.

Terrell is 60 years, exercises 3 days a week, and is asymptomatic from his stage IV slowly growing kidney cancer. He is tolerating single-agent immunotherapy without any side effects.

James is an older adult with an indolent B-cell lymphoma; he is frail, lives alone, and suffers from severe nausea, depression, and existential distress.

Rachel is asymptomatic from her newly diagnosed stage IV metastatic breast cancer, but her caregiver suffers existentially confronting the reality of her never being called grandma.

Randomized trials of early PC referred patients regardless of symptom burden or supportive care need as long as they met predefined, time-based criteria (eg, time from diagnosis and/or prognosis), resulting in universal referral within 3 months of diagnosis.[12-17] In our case examples, Terrell and Rachel would be defaulted to early PC,[1] while ignoring that James may have the greatest need. The early PC model assumes all patients with advanced cancer require symptom management or specialist PC at diagnosis, which is not true.[18,19]

Challenges Aligning Early PC Triggers With Workforce Capacity, and Patient and Caregiver Needs

Regrettably, the proportion of patients with advanced cancer outstrip the specialty PC workforce capacity.[20] In the United States, there are currently about 1,700-3,300 full-time equivalents of board-certified PC specialists, most of whom are not oncology-specific, and care for patients with other serious illness.[21,22] Unfortunately, the current pipeline for future PC physicians is narrow, with approximately 120 fellowship slots available each year, meaning workforce shortages will persist and worsen over time.

Even if capacity was not an issue, generalizing the benefit for early PC from seminal trials is problematic. Although early PC trials between 2002 and 2015 point to benefits in QOL and goal-concordant care,[3] there is marked heterogeneity in trial quality and rigor, and weak evidence for these associations.[3] In fact, a recent randomized cooperative group study, performed at 18 academic and community sites, did not demonstrate improvement in QOL for early PC.[13] Fifteen percent of patients in the early PC intention-to-treat arm were never seen by a PC specialist, reflecting the poor infrastructure for PC delivery.[23] Nationally, PC teams are partially constructed,[24] dose intensity is variable,[25] and equity issues exist: patients seen by PC tend to be White, have higher socioeconomic status, live on the West Coast or Northeast, and receive primary oncologic care in an academic medical center.[26] These issues highlight the need to reimagine PC delivery.

Moving From Early PC to Precision PC

The model for PC delivery should transition from *early PC* as the standard of care to precision PC (Fig 1). With the current standard of care, a cohort of 30 patients with stage IV gastric cancer are appropriate to refer to specialty PC on the basis of disease characteristics as outlined in guidelines. Owing to capacity constraints, only 20 of those patients are scheduled an appointment with a specialty PC clinician within 2 months.
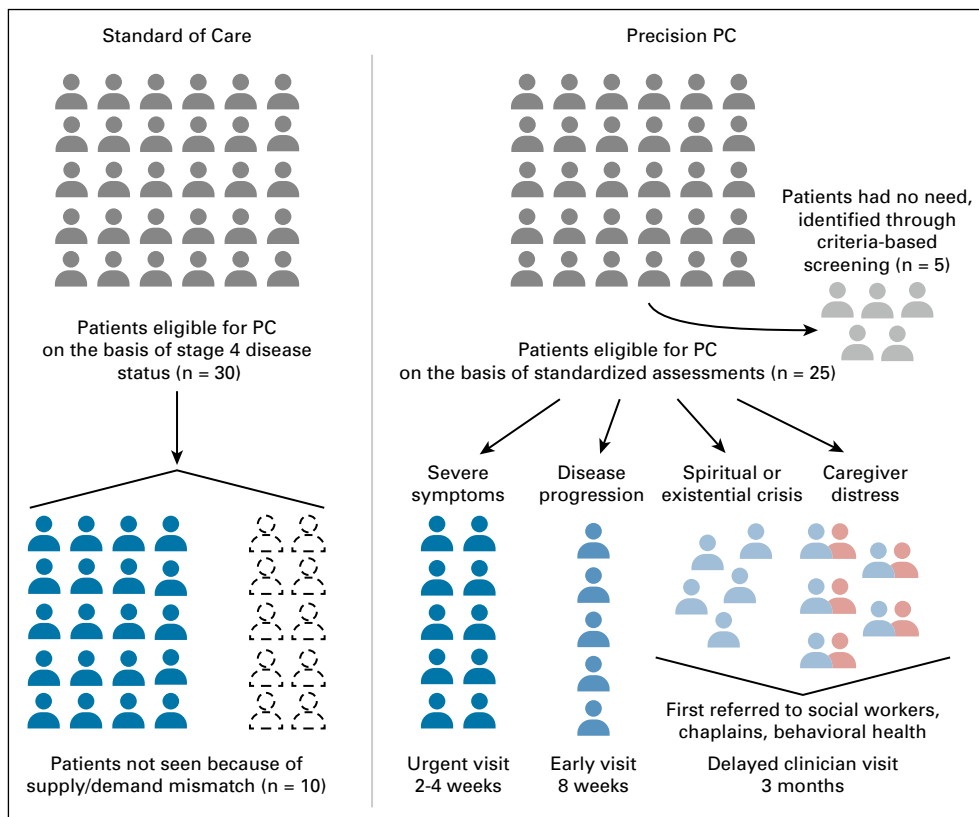
FIG 1. Standard early PC versus precision PC delivery. PC, palliative care.

Importantly, these appointments are agnostic to patient or caregiver need.

In a precision PC framework, supply and capacity are met when referral is personalized on the basis of patient and/or caregiver needs. This requires (1) routine systematic screening of supportive care needs, (2) consensus referral criteria that considers local resources, (3) timely triage and targeted services, and (4) adherence to behavioral economic principles.[27]

The first element of precision is establishing consensual criteria and having a system in place to trigger referral when appropriate. PC need (Fig 1) can be identified using consensus criteria validated in outpatient settings.[28] This includes severe physical or emotional symptoms, request for hastened death, spiritual or existential crisis, assistance with decision making or care planning, patient request, delirium, brain or leptomeningeal disease, spinal cord compression or cauda equine, within 3 months of advanced or incurable cancer for patients with a median survival of 1 year or less, or progressive disease despite second-line systemic therapy for an incurable cancer. These factors could be assessed by structured EHR data, patient-reported outcome (PROs), and machine learning.

The next element of precision is timely triage. In our precision PC example, 25 patients meet criteria for PC need on the basis of Delphi criteria. Five patients with low levels of PC need are deferred from PC referral until they or their caregivers desire it, or when the level of PC need increases. In fact, ongoing is a randomized trial of stepped PC versus early PC (ClinicalTrials.gov identifier: NCT03337399). In this noninferiority trial, patients participate in outpatient PC visits at key points in their illness trajectory (including at the time of diagnosis, after changes in their cancer therapy, and after a hospitalization), with routine monitoring of QOL to ensure that those whose QOL deteriorates step up to more frequent PC visits. This will be compared with the established model of monthly PC visits, offering a more accessible, scalable, and patient-centered approach to ambulatory PC.

The third element of precision is targeted services. One fundamental aspect of PC is its interdisciplinary nature. In our cohort of patients with stage IV gastric cancer, 10 patients are flagged due to severe symptoms and are offered an urgent visit. Five patients meet criteria because of brain metastasis and progression on second-line therapy, and are offered an early visit within 8 weeks, understanding they will also see neurosurgery, radiation oncology, and the phase I team for trial evaluation. Five patients are noted to suffer from existential and/or spiritual crisis. An additional five are flagged as appropriate for PC because of caregiver distress. These 10 patients are offered a delayed PC clinician visit, within 3 months, and are meanwhile scheduled to see other members of the PC team, such as chaplaincy, social work, or behavioral health. Targeted services match the supply of

patients needing an urgent visit (15 patients) to available new patient appointment slots. In fact, five new patient appointments remain open for urgent needs that may develop in subsequent weeks.

Although nascent, there are examples of precision PC in real-world practice. In one study at our institution, patients at high risk of death within 6 months were flagged by a machine learning mortality prediction model, and their oncologists nudged to consider early serious illness conversations while awaiting specialty referral to better understand patient and caregiver needs.[29] An analogous mortality prediction model–based intervention at Stanford demonstrated improvement in advance care planning and documentation of prognosis.[30] At Princess Margaret, in the STEP trial, targeted PC referral was implemented according to an algorithm based on symptom severity.[9] Forty percent of patients never screened positive and QOL, symptom control, and mood remained stable over time demonstrating early PC was not necessary for those with mild symptoms.[9]

Precision PC Is What Patients and Caregivers Want

Qualitative research with patients and caregivers who have received PC unveil several key insights: they prefer care that is flexible in timing, steered by needs rather than clinician intuition, and focused on the family unit of care.[31,32] Caregivers report improved satisfaction with care when PC is involved.[33] Improvement in satisfaction is unrelated to the number of PC visits attended by the caregiver, as it is mediated by an observation of better care for the patient.[34]

There are several steps necessary to meet patient and caregiver needs. First, automated assessments using PROs should be embedded into the EHR. Several randomized controlled trials have found that routine symptom monitoring is not only associated with improved QOL, but also longer survival.[35,36] PROs enable not only real-time identification of PC need, but targeted referral to specific PC services. An inventory of suggested tools that assess multiple domains at risk is included in Appendix Table A1 (online only). Ideally, these assessments should be (1) available beyond the clinical encounter to allow timely upstream intervention, (2) embedded into the EHR as structured searchable data, and (3) integrated into clinical workflow with personnel dedicated to follow-up and triage. To use PRO data to identify patients' needs and direct care, we need to solidify computational methods to interpret large PRO data sets and clear mechanisms to flag missing information to capture unmet needs.[37]

Second, a common system barrier to timely PC referral is limited PC program infrastructure. Only 40% of non–National Cancer Institute–designated cancer centers report having PC services available.[38] Where available, community PC teams are less likely to be interdisciplinary, a key element for success.[39] Multidisciplinary PC teams, as opposed to single clinician services, are necessary for precision PC. Payers should consider value-based alternative payment models that provide bundled payments for PC-eligible individuals, to incentivize targeted referrals to behavioral health, social work, chaplaincy, physical therapy, and other services that address various aspects of PC need without the pressure to demonstrate financial viability of clinician-billed services. Extension of telehealth waivers, which began in response to the COVID-19 pandemic, may also increase access for patients and caregivers, and encourage innovation in PC delivery with regards to the supply/demand problem.

Third, medical oncologists who remain in power to influence change must own their responsibility to both deliver excellent primary PC, and support implementation of PC initiatives. Good leaders know the ripple effect of institutional culture. To this extent, oncology leaders should endorse the WHO view of PC as a core component of health systems.[40] Outpatient PC programs would do better if they shared resources and budgets with oncology practices to build together.[37] What if, oncologists insisted PC integration, implementation of PROs,[35,36] and expansion of their multidisciplinary care team to include social work, chaplains, mental health providers, and care navigators was essential to their work, instead of it being an added benefit.

Insights from behavioral economics dictate that normative appeals to leadership endorsed standards can modify clinician behavior.[41,42] What does it say when clinicians receive monthly e-mails detailing their relative value unit reports and not the frequency of their panels unmet needs? It signals that volume trumps quality. What we measure and incentivize matters. The EHR offers a unique opportunity to change behavior and facilitate best practice. The EHR can (1) administer PROs for screening, (2) display supportive care needs for the multidisciplinary care team, (3) offer best practice alerts and/or nudges for referral, (4) default a referral order, and (5) provide a dashboard to track key metrics.[6,43] Successful work in behavioral science has already incentivized earlier referral to specialty PC,[11] hospice use,[41] and better conversations for seriously ill patients.[29,30,44]

In conclusion, specialty PC has a major role in cancer care delivery, although it must be deployed in a staged and sustainable fashion, targeted to individual and caregiver needs. As it now stands, current clinical guidelines for specialty PC referral apply a one-size-fits-all framework to often nuanced levels of PC need. Even 10 years after the seminal New England Journal of Medicine trial,[12] what qualifies an advanced cancer prognosis has changed dramatically. As precision oncology has taken hold in the care of our patients with cancer, PC delivery models must too adopt a precision framework.

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APPENDIX

TABLE A1. Inventory of Measurement and Evaluation Tools

Assessment Tool	Time to Complete, Minutes
Pain and symptom management	
Edmonton Symptom Assessment Scale[45]	1
Functional status	
ECOG performance scale[46]	1
Karnofsky performance scale[47]	1
Psychosocial care	
FICA Spiritual Assessment Tool[48]	3
NCCN Distress Thermometer[49]	3
PHQ-4[50]	2
Caregiver assessment	
Caregiver Strain Index[51]	3
FAMCARE scale[52]	5
Social support	
RAND medical social support scale[53]	4

Abbreviations: ECOG, Eastern Cooperative Oncology Group; FAMCARE, Family Satisfaction with End-of-Life Care; FICA, Faith, Importance and Influence, Community, and Address; NCCN, National Comprehensive Cancer Network; PHQ-4, Patient Health Questionnaire-4; RAND, Research and Development Corporation.