

Original Article

Effects of Implementation of a Standardized Palliative Care Pathway for Patients with Advanced Cancer in a Hospital: A Prospective Pre- and Postintervention Study



Annemieke van der Padt-Pruijsten MD, Maria B.L. Leys MD, Esther Oomen-de Hoop PhD, Agnes van der Heide PhD, and Carin C.D. van der Rijt MD, PhD

Department of Internal Medicine (A.v.d.P., M.B.L.L.), Maastricht Hospital, Rotterdam, the Netherlands; Department Medical Oncology (A.v.d.P., E.O.-d.H., C.C.D.v.d.R.), Erasmus MC Cancer Institute, Rotterdam, the Netherlands; Department of Public Health (A.v.d.H.), Erasmus MC, University Medical Centre Rotterdam, Rotterdam, the Netherlands

Abstract

Context. Early integration of oncology and palliative care has been recommended to improve patient outcomes at the end of life. A standardized Palliative Care Pathway, consisting of a structured electronic medical checklist, may support such integration.

Objectives. We studied the effect of implementation of a Palliative Care Pathway on patients' place of death and advance care planning.

Methods. We conducted a prospective pre- and postimplementation study of adult patients with cancer from a single hospital who died between February 2014 and February 2015 (pre-implementation period) or between November 2015 and November 2016 (post-implementation period).

Results. We included 424 patients in the pre- and 426 in the post-implementation period. The pathway was started for 236 patients (55%) in the post-implementation period, on average 33 days (IQR 12-73 days) before death. 74% and 77% of the patients died outside hospital in the pre- and post-implementation period, respectively ($P=0.360$). When the PCP was initiated, 83% died outside hospital. Bad-news conversations (75% and 62%, $P<0.001$) and preferred place of death (47% and 32%, $P<0.001$) were more often documented in the pre-implementation period, whereas a DNR-code was more often documented during the post-implementation period (79% and 89%, $P<0.001$).

Conclusions. Implementation of a Palliative Care Pathway had no overall positive effect on place of death and several aspects of advance care planning. Start of a Palliative Care Pathway in the last months of life may be too late to improve end-of-life care. Future research should focus on strategies enabling earlier start of palliative care interventions. *J Pain Symptom Manage* 2021;62:451–459. © 2021 The Authors. Published by Elsevier Inc. on behalf of American Academy of Hospice and Palliative Medicine. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>)

Key Words

"Palliative Care Pathway"; integration of palliative care in oncology care, cancer, advance care planning, end-of-life care

Key Message

We describe a prospective pre- and post-implementation study on a digital Palliative Care Pathway (PCP) in oncology care to support the integration of palliative care. Implementation in clinical practice was challenging; the PCP was started late in patients' disease

trajectory, which possibly explains why indicators of ACP did not improve.

Introduction

Palliative care is aimed to improve the quality of life of patients and their families facing the problems

Address correspondence to: Mrs. Annemieke van der Padt-Pruijsten, MD, Department of Internal Medicine, Maastricht Hospital, Rotterdam, the Netherlands, Maastrichtweg 21,

3079 DZ Rotterdam, The Netherlands. E-mail: PruijstenA@maasstadziekenhuis.nl

Accepted for publication: 2 February 2021.

associated with incurable illness, such as advanced cancer.¹ Early integration of palliative care in oncology is important for timely discussing patients' care needs and preferences, which has been shown to improve the quality of end-of-life care.²⁻⁷ However, integration of palliative care in oncology care is complex. The Lancet Oncology Commission has described different models for such integration, where an essential component is patient-centered care by using standardized care pathways and a multidisciplinary team approach. The Commission recommends combining a tumor-directed and host-directed approach. This can be done independently of patients' prognosis and treatment intention.⁸⁻¹²

A structured approach and a standardized care pathway could support healthcare professionals who are not specialized in palliative care in preparing patients to identify their end-of life goals. Such an approach should contain at least the following components²:

- Early recognition of the last stage of life: the surprise question ("Would you be surprised if this patient died within the next 12 months?") is an often used tool to identify patients who might benefit from palliative care and start advance care planning (ACP) conversations.^{2,13,14}
- ACP conversations: when healthcare professionals are aware of patients' limited life expectancy, they should inform patients and discuss their goals and preferences for (future) medical treatment and care. These goals and preferences should also be discussed with family and other healthcare professionals.^{2,4,6,7}
- Documentation of ACP conversations in patients' medical record: ACP conversations are usually recorded in patients' medical files. Patients can also choose to write a living will ('advance care directive') to clarify their preferences,¹⁵ although it is complex to ensure that all attending healthcare providers are informed about such documented preferences.

To improve early integration of palliative care in oncology care, we developed a standardized "Palliative Care Pathway" (PCP) for patients with advanced, incurable cancer. The PCP is a structured electronic medical checklist to guide healthcare professionals in their provision of palliative care. Besides facilitating advance care planning, the PCP encourages communication between healthcare professionals from the hospital and the primary care physician, who is the general practitioner in the Netherlands. Nowadays, cancer care is provided more in outpatient settings and most patients prefer to be cared for and eventually die at home.^{5,16-18} General practitioners in the Netherlands

are trained to provide palliative care at home.²⁰⁻²² In contrast to other developed countries in Europe, where end-of life care is more hospital-centred for patients with cancer, in the Netherlands most patients die outside the hospital where medical care is predominantly provided by the general practitioner.¹⁹

We performed a study to examine whether the number of patients with advanced cancer dying outside the hospital would increase after implementation of the PCP. In addition, we studied the effect of the PCP on the number of hospitalizations, documentation of advance care planning and communication with the general practitioner.

Methods

Design and Study Population

We performed a prospective single-center pre- and postintervention study at the in- and outpatient clinic of a large general teaching hospital (Maastad Hospital, Rotterdam) in the Netherlands. The departments of Oncology/Haematology and Lung diseases participated in the study. Data were collected from adult patients with cancer who had been treated at in- or outpatient clinics and died between February 2014 and February 2015 (pre-PCP period) or between November 2015 and November 2016 (post-PCP period). Patients were excluded when they had been referred to another hospital for further treatment.

In the pre-PCP period, care was provided as usual. Nine months after implementing the PCP, we started to include patients for the post-PCP period. We aimed to use the PCP for at least 50% of patients who would die from their disease. In our analysis, we used the intention-to-treat principle, meaning that we included all deceased patients, no matter if the PCP had actually been applied or not.

Ethics

This study was conducted in accordance with the Declaration of Helsinki. According to Dutch legislation, written informed consent of the patients was not required because data were gathered after the patients' death by healthcare professionals of the hospital and processed anonymously. The Medical Ethical Research Committee of the Maastad Hospital (TWOR 2013/51) approved the study at 19/12/2013 and the study was registered in the Netherlands Trial Register (NL4400 (NTR4597)).

Intervention

A digital 'Palliative Care Pathway' was developed by a multidisciplinary group (a haematologist specialized in palliative care, an anesthesiologist, a neurologist, a

cardiologist, an elderly care physician specialized in palliative care, palliative care nurse specialists, the chief medical information officer and ICT consultants). The PCP is a structured electronic medical checklist following Dutch and international guidelines for palliative care and ACP.^{7,23} All four dimensions of palliative care are included in the PCP: physical, psychosocial, social and spiritual. The PCP can be used alongside tumor-specific care pathways.

Once a patient is identified as eligible for the PCP, the physician uses a special button in the electronic medical record that links to the PCP. After opening the PCP, various prompts guide the physician to explore patients' needs. Furthermore, the PCP includes buttons to consult other healthcare professionals, e.g. for psychosocial support or alleviation of symptoms and buttons to reach the institutional protocols and national palliative care guidelines. Not every domain needs to be completed in one session; the checklist is more like a guide for the physician to make them aware of the patients' palliative care needs over time. When a physician has started the PCP, every healthcare professional, including nurses, can access the information documented in the PCP by a button at the front page of the electronic medical record.

The PCP contains guidance on:

- (i) recognition of patients' limited life expectancy by using the surprise question.
- (ii) patients' preferences, values and needs (e.g. regarding ACP).
- (iii) physical and emotional support needs.
- (iv) documentation of bad-news conversations.
- (v) involvement of family and relatives.
- (vi) coordination of care, e.g., communication with the general practitioner, involvement of a palliative care team, pain team, social worker, psychologist, and/or spiritual counsellor.

Indications to start the PCP are:

- (i) negative answer to the surprise question ("would I be surprised if my patient would die within a year?").
- (ii) no more anticancer treatment options available.
- (iii) deterioration of patient's performance status.
- (iv) severe complication of a medical treatment.
- (v) patients' wish to stop all medical treatments.

Education

All physicians (interns, residents and specialists) and nurses of the participating departments were trained by a physician and palliative care nurse on how to use the PCP in a 30–45 minute training session. All medical staff from other departments was informed in

writing, including the nurses/physicians of the emergency department.

Implementation

The surprise question was discussed during grand rounds and multidisciplinary team meetings for all in- and outpatients at the first diagnosis of incurable cancer or when a patient's disease was found to progress. If the answer to this question was no, the oncologist/pulmonologist would start the PCP. Every 3–4 weeks, a member of the research team (CL/AvdP) evaluated the use of the PCP; when deemed useful, they provided extra education to individual healthcare professionals, including those who were new at the department.

Endpoints

The primary endpoint of this study was the percentage of out-of-hospital deaths. Secondary endpoints were:

- (i) the percentage of deceased patients for whom bad-news conversations were documented in the medical record.
- (ii) the percentage of patients dying at their place of preference.
- (iii) the percentage of deceased patients for whom DNR-codes were documented in the medical record.
- (iv) the percentage of deceased patients who had been hospitalized in the last three months of life.
- (v) the percentage of deceased patients for whom communication with the general practitioner about end-of life issues was documented in the last 3 months of life.

Data Collection

We developed a checklist with 44 items. Data were collected from patients' medical electronic records and included patients' diagnosis and sociodemographic characteristics; use of the PCP; documentation of bad-news conversations, i.e. discussions on limited prognosis, treatment options, end-of-life discussions, the exhaustion of available anticancer treatments and options for supportive care; patients' preferred place of death and actual place of death; DNR-codes; hospitalizations during the last 12 months of life and communication with the general practitioner in the last 3 months of life. General practitioners were requested to check the specific place of death outside the hospital.

Statistical Analysis

Sample Size. Patients were included in either the pre- or post-PCP period during 1 year. It was expected that up to 400 patients could be included per year. Assuming a

two-sided alpha of 5% and a difference of 10% between the pre- and post-implementation period, a power of 79% would be obtained with 800 patients in total, if 50% of the patients in the pre-implementation period would die outside the hospital. The power would increase to 83% or even 89% with 60% or 70% of patients in the pre-implementation period dying outside the hospital, respectively.

Analyses. The pre- and post-PCP period were compared according to the intention-to-treat principle, i.e. all patients were included regardless of whether the PCP was started or not in the post-PCP period. The statistical significance of differences between the pre- and post-PCP period was tested using t-tests, Mann-Whitney U tests, chi-square tests or Fisher's exact tests, where applicable. For the patients for whom a PCP was started during hospital admission, we explored the correlation in time between start of the PCP and the documentation of end-of-life decisions.

Furthermore, a per-protocol analysis was performed where only patients of the post-PCP period were included for who the PCP was started. Furthermore, a subgroup analysis of this group was performed where a further selection was made of patients for whom the PCP was started in the outpatient setting. Analyses were performed similarly as for the intention-to-treat analyses.

Results

Patients

In total 850 patients were included, 424 in the pre-PCP period and 426 patients in the post-PCP period. Their mean age at death was 70.9 and 71.5 years, respectively, and most patients were male (58% and 56%). Lung cancer, colorectal cancer and

hematological cancers were the most common primary cancer types (Table 1).

Implementation of the PCP

The PCP was used for 236 patients (55%) after implementation. It was started a median of 33 days (IQR 12–73 days) before death. It was started in the outpatient setting in 125 patients (53%) a median of 51 days (IQR 26–107) before death, and during hospital admission in 111 patients (47%) a median of 16 days (IQR 7–37) before death.

Effects of the PCP

Intention-To-Treat Analysis. In the pre- and post-PCP period, 74% and 77% of the patients died outside the hospital, respectively ($p=0.360$). A small shift is seen from home to hospice in the post-PCP group (Table 2) Approximately half of the patients who died in the hospital in both the pre- and post-PCP period (43% vs. 47%, respectively) did so because of specific circumstances: patients had a preference for dying in the hospital, patients were too ill to leave the hospital or deteriorated before a transfer could be organized.

In the pre-PCP period, bad-news conversations were documented more often and earlier than in the post-PCP period (75% and 62%, respectively, $P < 0.001$; median of 63 and 39 days before death, respectively, $P = 0.067$). Patients' preferred place of death was also more frequently documented in the pre-PCP period than in the post-PCP period (47% and 32%, respectively, $P < 0.001$); the moment of such documentation was similar (median of 18 and 17 days before death, respectively $P = 0.514$). DNR-codes were more often documented during the post-PCP period (79% and 89% for pre- and post-PCP period respectively, $P < 0.001$), while the moment of documentation was

Table 1
Patient Characteristics

	Pre-PCP (N= 424) (mean SD)	Post-PCP (N= 426) (mean SD)	Pvalue
Age at death (years)	70.9 (11.2)	71.5 (10.8)	0.435
Gender	N (%)	N (%)	0.526
Male	248 (58)	240 (56)	
Female	176 (42)	186 (44)	
Primary cancer ^a			0.044
Lung	148 (34)	130 (29)	
Colorectal	56 (13)	50 (11)	
Hematological	39 (9)	68 (15)	
Gastric/Oesophageal	38 (9)	39 (9)	
Breast	33 (8)	41 (9)	
Bile-pancreatic	30 (7)	38 (8)	
Prostate	31 (7)	30 (7)	
Urogenital (excl. prostate)	13 (3)	27 (6)	
Gynecological	8 (2)	4 (1)	
Other	35 (8)	29 (6)	

^a37 patients had 2 or 3 primary cancers.

Table 2
Place of Death

	Pre-PCP (N= 424)	Post-PCP (N= 426)	P value
Place of death	N (%)	N (%)	0.360
Hospital	110 (26)	99 (23)	
Outside hospital	314 (74)	327 (77)	
Home	198 (47)	169 (40)	
Hospice	56 (13)	81 (19)	
Nursing home	31 (7)	32 (8)	
Outside hospital-other	6 (1)	11 (3)	
Outside hospital-unknown	23 (5)	34 (8)	

similar (a median of 61 and 69 days before death, respectively, $P = 0.591$) (Fig. 1 and Table 3). No differences were found in the percentage of patients who had been admitted to the hospital in the last 90 days of life (68% vs. 69%, $P = 0.625$) and the number of inpatient days (median 6.0 vs. 5.0 days, $P = 0.999$) between the pre- and post-PCP period. The number of admissions per patient in the last 12 months of life was not significantly different between both groups either (Fig. 2).

For patients for whom the preferred place of death was known, around 80% of the patients in both the pre- and post-PCP groups actually died in their

preferred place ($P = 0.270$). However, for 53% of patients in the pre-PCP period and 68% of patients in the post-PCP period the preferred or actual place of death was unknown (Table 4).

Per-protocol and Subgroup Analyses. In the per-protocol analyses, more patients for whom a PCP was started died outside the hospital compared with patients in the pre-PCP group (83% and 74%, respectively, $P = 0.012$). A similar percentage of patients dying outside the hospital was found for the subgroup of patients for whom the PCP was started in the outpatient setting (84%). Documentation of bad-news was similar in the patients

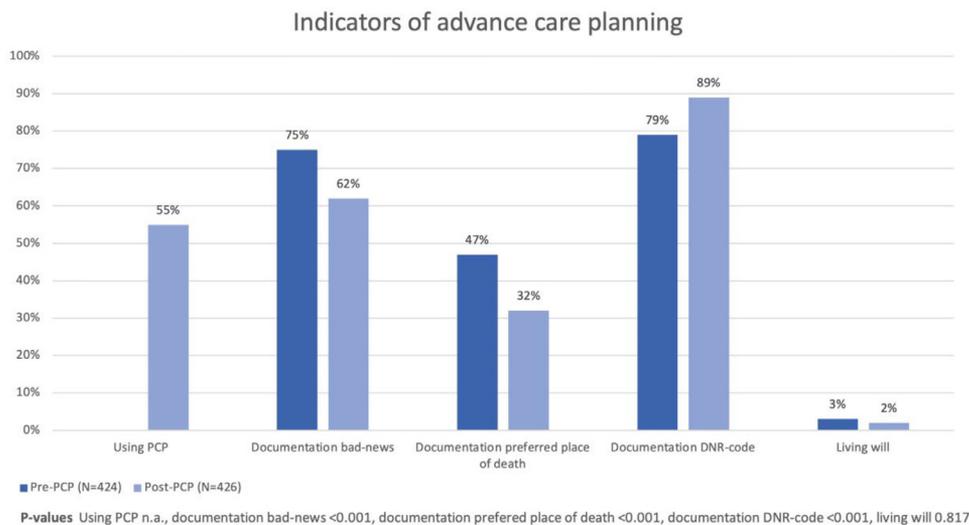


Fig. 1. Indicators of advance care planning.

Table 3
Moment of Documentation of Indicators of Advance Care Planning (Median Days Before Death)

	Pre-PCP (N= 424)		Post-PCP (N= 426)		P value
	Median	Range (IQR)	Median	Range (IQR)	
Using PCP	n.a.		33	12–73	
Documentation bad-news	63	18–209	39	12–127	0.0067
Documentation preferred place of death	18	5–42	17	5–48	0.514
Documentation DNR-code	61	20–218	69	20–209	0.591

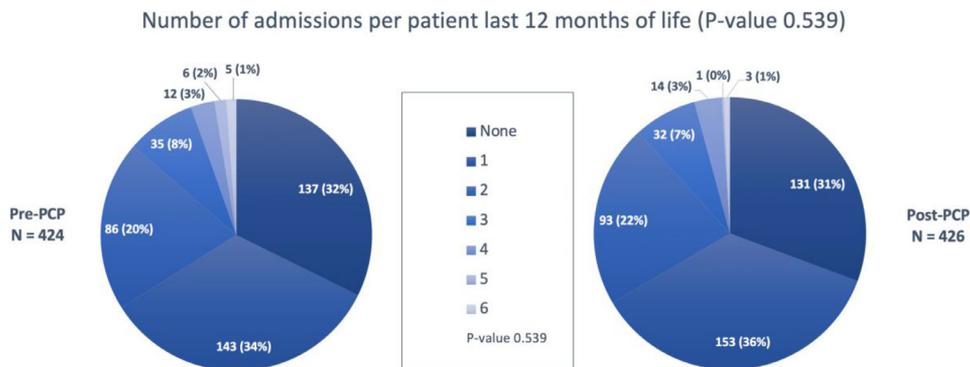


Fig. 2. Number of admissions per patient in the last 12 months of life.

Table 4
Actual Vs. Preferred Place of Death

	pre-PCP (N (%))				post-PCP (N (%))					
	Preferred	Hospital	Outside hospital	Missing	Total	Preferred	Hospital	Outside hospital	Missing	Total
Actual										
Hospital		11 (85)	42 (23)	57 (25)	110		6 (100)	23 (18)	70 (24)	99
Outside hospital		2 (15)	144 (77)	168 (75)	314		0	105 (82)	222 (76)	327
Total		13	186	225	424		6	128	292	426

for whom the PCP was started, the patients with the start of the PCP in the outpatient setting and the patients in the pre-PCP group (76% and 74% vs. 75%, respectively). Documentation of preferred place of death was only significantly better in the pre-PCP group compared with the group of patients for whom the PCP was started in the outpatient setting (47% and 26%, respectively, $P < 0.001$). DNR-codes were more frequently documented when the PCP was used compared to the pre-PCP group (97% and 79%, respectively, $P < 0.001$). Bad-news and DNR-codes were often documented prior to starting of the PCP. Full results of the subgroup analyses can be found in the supplemental tables and figure.

In the group of patients for whom the PCP was started during hospitalization we analyzed the

correlation in time between start of the PCP and the documentation of end-of-life decisions. In this subgroup of inpatients, bad-news conversations, preferred place of death and DNR-codes were often documented during the same admission (56%, 46%, and 56%, respectively) (Table 5).

Communication With Patients' General Practitioner

The percentage of patients for whom there had been communication with the general practitioner about the patients' health status did not significantly change after implementation of the PCP. Communication with the general practitioner only improved for patients who died in the hospital (80% and 96% respectively, $P = 0.001$) (Table 6).

Table 5

Time Course of the Documentation of End-of-Life Decisions for Patients for Whom the PCP Was Started During Admission

N (%)		Total (N=111)
Documentation bad-news	Before the respective admission	19 (17)
	During same admission – PCP+ started	62 (56)
	After the respective admission	6 (5)
	No documentation	24 (22)
Documentation preferred place of death	Before the respective admission	3 (3)
	During same admission – PCP+ started	51 (46)
	During the respective admission	7 (6)
	No documentation	50 (45)
Documentation DNR-code	Before the respective admission	42 (38)
	During same admission – PCP+ started	62 (56)
	During the respective admission	3 (3)
	No documentation	4 (4)

Table 6
Communication

	Pre-PCP (N= 424)	Post-PCP (N= 426)	P value
Type of information shared with general practitioner	N (%)	N (%)	
Diagnosis incurable cancer	379 (89)	397 (93)	0.052
Anticancer treatment	292 (69)	298 (70)	0.766
Transfer of primary responsibility for care to general practitioner or an elderly care physician (nursing home)	174 (41)	152 (36)	0.121
	(N= 110)	(N= 99)	
In hospital death	87 (79)	94 (95)	0.001

Discussion

Evidence suggests that early integration of palliative care in oncology practice improves patients' survival and quality of life. However, adequately integrating both services is challenging.^{9–12,17,24}

We implemented a standardized PCP to support healthcare professionals not specialized in palliative care to early integrate palliative care in oncology care for patients with advanced cancer and thereby improve patients' outcomes at the end of life. Place of death and dying at patients' preferred place of death are often used as outcome measures in palliative care.^{6,16,25,26} In this pre- and post-intervention study we found no differences in the percentage of out-of-hospital deaths in the intention-to-treat analysis. In our study, the percentage of patients dying outside the hospital was already relatively high (74%) in the pre-PCP period and comparable to the nationwide percentage (71% in 2010).²² In the group of patients in the post-PCP group for whom the PCP was actually used, we found that a significantly higher proportion died outside the hospital compared with the pre-PCP group (83% vs. 74%).

We found no significant overall positive effect of the PCP on other outcome measures. A possible explanation for these results could be the timing of use of the PCP. The PCP was started only at a median of 33 days before death. We aimed for an earlier start, potentially alongside a tumor-specific care pathway, by using a negative answer on the surprise question as the primary indication to start the PCP. The late start of the PCP could be due to the more specific alerts we also introduced for using the PCP, such as 'no more options for anticancer treatment being available', which may indicate a more limited life expectancy than one year. Another explanation could be the implementation strategy: one of the moments to discuss patients' prognosis and treatment options and thus to start the PCP was during grand rounds for inpatients. In the post-PCP group 47% of the patients were admitted to the hospital at the time of starting the PCP, which occurred at a median of only 16 days before death in this group. Documentation of bad-news, preferred place and DNR-code were often registered during the same admission where the PCP was started.

The healthcare professionals can use the PCP as a guide for ACP conversations and the PCP provides an easily accessible place to document and be informed of these conversations. There seems to be no association between discussing a DNR-code and use of the PCP, because DNR-codes were often documented earlier than the start of the PCP (64 days vs. 33 days before death, respectively, in the group of patients for whom the PCP was started). Surprisingly, bad-news conversations and preferred place of death were more often documented in the pre-PCP period. A health care quality management program (Joint Commission International (JCI)) in the Maastricht hospital that was implemented during the pre-PCP period might have raised awareness to discuss resuscitation and to better register medical care in patients' medical records but may have caused some restraint for other registrations. Furthermore, no differences were found for hospitalizations in the last 3 months of life. Only the proportion of patients for whom there had been communication with the general practitioner improved for patients who died in the hospital in the post-PCP period (80% and 96%, respectively).

We intended to support the healthcare professionals in the hospital in delivering non-specialized palliative care alongside concurrent tumor-specific care pathways. As such our approach was distinct from studies on the effectiveness of specialized palliative care teams, some of them showing beneficial effects on various patient outcomes,²⁷ although other found no clear effects.^{28,29} However, a recent review of 169 studies from 23 countries indicated that in daily practice the median duration from initiating specialized palliative care services to death was a few weeks (18.9 days), even shorter than the start of the PCP in our study.³⁰ Timing of the initiation of palliative care therefore seems a global challenge, for non-specialized as specialist palliative care.

A major strength of our study is the prospective design in which the PCP was implemented in every day clinical practice. With this design we were able to include all patients who had been treated in the Maastricht hospital and died during the pre- and post-PCP periods. We aimed to offer a structured electronic PCP

alongside tumor specific pathways that can support health care professionals not specialized in palliative care to initiate ACP conversations with patients preparing them for end-of-life decisions. This study has several limitations. Although a broad information and education strategy was used, we may have especially reached the inpatient setting. In almost half of the cases the PCP was started in the inpatient setting during a hospitalization for symptom control, mostly after the exhaustion of anti-tumors therapy, which may have been too late to have an impact on end-of-life care. To enhance the utility of the PCP earlier in the disease trajectory, we could eliminate the criterion 'no more options for anti-cancer treatment being available' for entering the pathway. Moreover, the surprise question may especially support the identification of patients who have a substantially shorter life expectancy than one year.¹⁴ Therefore, better tools are needed. Combining the surprise question with objective parameters, such as patients' performance status and laboratory parameters (e.g. albumin), could improve clinicians' ability to identify patients in need of palliative care earlier in the disease trajectory. To achieve early integration, these tools should especially be used in outpatient setting, for example, when goals of care in cancer treatment change to non-curative. Besides better tools, specific education on the discussion of ACP seems indicated. A recent focus group study from our group explored physicians' views on identifying and discussing the last phase of life of patients by using the surprise question. Physicians stated to have doubts to open the discussion with patients, because they were concerned about deprivation of hope, prognostic uncertainty and unknown consequences for the physician–patient relationship.³¹ Therefore, more and structural education is necessary in a hospital-wide program to create awareness of ACP and of the option to involve other healthcare professionals (e.g. general practitioner, pain management team, specialist palliative care team). In addition, oncology nurses or physician assistants in oncology could be better engaged to practice the use of the PCP.

It is crucial that every healthcare professional in the hospital has basic knowledge and skills to provide good end-of life care to every eligible patient. When necessary, involvement of a specialized palliative care team could be added, which may be one of the most important outcomes of using a PCP.

Conclusion

Our study shows that implementation of the PCP did not have significant overall impact on place of death and several aspects of communication about end-of-life care, while actual use showed modest differences. Changes in the implementation strategy to facilitate earlier and more frequent use of the PCP are needed

and might effectively change the experiences of patients at the end of life.

Disclosures and Acknowledgments

C.C.D. van der Rijt received consulting fees from Kyowa Kirin. All remaining authors have declared no conflicts of interest. The authors would like to thank C. van Leijen, K. Mataw, F. Smit, S. Meurs and H. Nederveen for data collection and entry. F. Baar and C. van Leijen for developing and implementation of the PCP.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Data Availability

The data of this study are kept by A.P. and are available upon request.

Supplementary materials

Supplementary material associated with this article can be found, in the online version, at [doi:10.1016/j.jpainsymman.2021.02.003](https://doi.org/10.1016/j.jpainsymman.2021.02.003).

References

1. WHO. Definition of palliative care. Available at: <http://www.who.int/cancer/palliative/definition/en/> (Accessed April 10, 2018).
2. Kaasa S, Lode JH, Aapro M, et al. Integration of oncology and palliative care: a lancet oncology commission. *Lancet Oncol* 2018;19:e588–e653.
3. Jordan K, Aapro M, Kaasa S, et al. Society for medical oncology (ESMO) position paper on supportive and palliative care. *Ann Oncol* 2018;29:36–43.
4. Rietjens JAC, Sudore RL, Connolly M, et al. Definition and recommendations for advance care planning: an international consensus supported by the European association for palliative care. *Lancet Oncol* 2017;18:e543–e551.
5. Hui D, Bruera E. Integrating palliative care into the trajectory of cancer care. *Nat Rev Clin Oncol* 2016;13:159–171.
6. Brinkman-Stoppelenburg A, Rietjens JAC, van der Heide A. The effects of advance care planning on end-of-life care: a systematic review. *Palliat Med* 2014;28:1000–1025.
7. Schrijvers D, Cherny NI. ESMO Guidelines Working Group. ESMO clinical practice guidelines on palliative care: advanced care planning. *Ann Oncol* 2014;25(Suppl 3):iii138–iii142.
8. Ferrell BR, Temel JS, Temin S, et al. Integration of palliative care into standard oncology care: American Society of

Clinical Oncology clinical practice guideline update. *J Clin Oncol* 2017;35:96–112.

9. Temel JS, Greer JA, Muzikansky A, et al. Early palliative care for patients with metastatic non-small-cell lung cancer. *N Engl J Med* 2010;363:733–742.
10. Zimmermann C, Swami N, Krzyzanowska M, et al. Early palliative care for patients with advanced cancer: a cluster-randomised controlled trial. *Lancet* 2014;383:1721–1730.
11. Bakitas MA, Tosteson TD, Li Z, et al. Early versus delayed initiation of concurrent palliative oncology care: patient outcomes in the ENABLE III randomized controlled trial. *J Clin Oncol* 2015;33:1438–1445.
12. Temel JS, Greer JA, El-Jawahri A, et al. Effects of early integrated palliative care in patients with lung and GI cancer: a randomized clinical trial. *J Clin Oncol* 2017;35:834–841.
13. Moss AH, Lunney JR, Culp S, et al. Prognostic significance of the "surprise" question in cancer patients. *J of Palliat Med* 2010;13:837–840.
14. Downar J, Goldman R, Pinto R, Englesakis M, Adhikari NKJ. The "surprise question" for predicting death in seriously ill patients: a systematic review and meta-analysis. *Canadian Med J* 2017;189:E484–E493.
15. Billings JA. The need for safeguards in advance care planning. *J Gen Intern Med* 2012;27:595–600.
16. Gomes B, Higginson IJ, Calanzani N, et al. Preferences for place of death if faced with advanced cancer: a population survey in England, Flanders, Germany, Italy, the Netherlands, Portugal and Spain. *Ann Oncol* 2012;23:2006–2015.
17. Gomes B, Calanzani N, Curiale V, McCrone P, Higginson IJ. Effectiveness and cost-effectiveness of home palliative care services for adults with advanced illness and their caregivers. *Cochrane Database Syst Rev* 2013:CD007760.
18. Rubin G, Berendsen A, Crawford SM, et al. The expanding role of primary care in cancer control. *Lancet Oncol* 2015;16:1231–1272.
19. Bekelman JE, Halpern SD, Blankart CR, et al. Comparison of site of death, health care utilization, and hospital expenditures for patients dying with cancer in 7 developed countries. *JAMA* 2016;315:272–283.
20. Pivodic L, Pardon K, Van den Block L, et al. Palliative care service use in four European countries: a cross-national retrospective study via representative networks of general practitioners. *PLoS One* 2013;8:e84440.
21. Ko W, Miccinesi G, Beccaro M, et al. Factors associated with fulfilling the preference for dying at home among cancer patients: the role of general practitioners. *J Palliat Care* 2014;30:141–150.
22. van der Plas AG, Vissers KC, Francke AL, et al. Involvement of a case manager in palliative care reduces hospitalisations at the end of life in cancer patients; a mortality follow-back study in primary care. *PLoS One* 2015;10:e0133197.
23. National care standard for palliative care in the Netherlands 1.0; coordination platform for healthcare standards and the quality institute. ministry of health, welfare and sport. 2013. Available from: <https://www.netwerkpalliatievezorg.nl/Portals/141/zorgmodule-palliatieve-zorg.pdf>
24. Bernacki R, Paladino J, Neville BA, et al. Effect of the serious illness care program in outpatient oncology: a cluster randomized clinical trial. *JAMA Intern Med* 2019;179:751–759.
25. Beccaro M, Costantini M, Giorgi Rossi P, et al. Actual and preferred place of death of cancer patients. Results from the Italian survey of the dying of cancer (ISDOC). *J Epidemiol Community Health* 2006;60:412–416.
26. Meeussen K, Van den Block L, Echteld MA, et al. End-of-life care and circumstances of death in patients dying as a result of cancer in Belgium and the Netherlands: a retrospective comparative study. *J Clin Oncol* 2011;29:4327–4334.
27. Temel JS, Greer JA, Muzikansky A, et al. Early palliative care for patients with metastatic non-small-cell lung cancer. *N Engl J Med* 2010;363:733e742.
28. Nordly M, Benthien KM, Vadstrup ES, et al. Systematic fast-track transition from oncological treatment to dyadic specialized palliative home care: DOMUS – a randomized clinical trial. *Palliat Med* 2019;33:135–149.
29. Rocque GB, Campbell TC, Johnson SK, et al. A quantitative study of triggered palliative care consultation for hospitalized patients with advanced cancer. *J Pain Symptom Manage* 2015;50:462–469.
30. Jordan RI, Allsop MJ, ElMokhallalati Y, et al. Duration of palliative care before death in international routine practice: a systematic review and meta-analysis. *BMC Med* 2020;18:368.
31. Owusuaa C, Van Beelen I, Van der Heide A, Van der Rijt CCD. Physicians' views on the usefulness and feasibility of identifying and disclosing patients' last phase of life: a focus group study. Accepted *BMJ Support Palliat Care*.