

What is the evidence base for early palliative care integrated with acute oncology services in terms of oncology patient reported experience and outcomes, quality of life, and cost effectiveness?

Review Methods

Search Strategy:

A systematic search was conducted across a wide-ranging set of databases: Ovid Medline, including In-Process & Other Non-Indexed Citations, Ovid Embase, Ovid HMIC, Ovid PsycINFO, Ebsco CINAHL and Wiley Cochrane Library.

The preliminary search strategy was developed on Ovid Medline using both text words and Medical subject headings from January 2011 to February 2021 and restricted to English language only. The search strategy was modified to capture indexing systems of the other databases. (Search strategies available upon request).

Furthermore, to identify additional papers, the electronic tables of content for the last two years were scanned in the following journals:

- BMJ Supportive & Palliative care
- International Journal of Palliative Nursing
- Palliative Medicine

Reference lists of systematic reviews were checked for any relevant studies. The searches generated 276 citations after removing duplicates and irrelevant records. Figure 1 represents the flow of information through the different phases of the review.

Inclusion: Adults >18 years old with a life limiting cancer treated in/at an oncology inpatient service,

Exclusion:

Studies set in non-Organization for Economic Cooperation and Development (OECD) countries; Case series studies consisting of less than 25 patients; non-English language studies

Study selection/Quality Assessment/Data Extraction:

Study selection was based upon review of the abstract by two independent reviewers. The full text was then assessed independently using a pre-designed eligibility form according to inclusion criteria. Data extraction and quality assessment of the eligible studies was carried out by one reviewer and checked by another for accuracy. Quality assessment was carried out using the Specialist Unit for Review Evidence (SURE) checklist (<https://www.cardiff.ac.uk/specialist-unit-for-review-evidence/resources/critical-appraisal-checklists>). Any discrepancies between the two reviewers were resolved by consensus or by recourse to a third reviewer.

Context

Many acute hospital settings include both 'Acute Oncology Services' (AOS) and Specialist Palliative Care (SPCT) liaison teams that contribute to the management of complex cancer patients. Acute oncology services tend to provide advice on management of cancer related issues including oncological emergencies, streamlined access to site specific oncology teams or the patient's own oncologist, and specialist oncology services like emergency radiotherapy (National Chemotherapy Advisory Group 2009).

The role of the SPCT is broad and includes advice on management of symptoms, emotional support for patients and their families, complementary therapies, assistance with discharge planning for last days of life and for complex communication. Within these roles there is sometimes crossover requiring the teams to work together closely alerting each other to patients who may benefit from the other's specialism.

There is reported evidence that meeting a specialist palliative care team early in the patient's oncological journey can improve several outcomes including symptom severity, quality of life (Zimmermann et al. 2014) and mood (Temel et al. 2010) compared to standard oncological care (Zimmermann et al. 2014, Greer et al. 2013).

The aim of this rapid review was to look at models where acute oncology and specialist palliative care teams worked together when a patient was admitted acutely to hospital to see if this combined approach improved patient outcomes. In the review itself, given the recent emergence of AOS, we didn't find evidence for specific integration of AOS and SPCT models. There was evidence for the impact of palliative care intervention for oncology patients when admitted to acute sector.

Key Findings

Out of 342 studies initially identified, 178 abstracts were screened, and 26 papers retrieved. Of those full papers reviewed, 6 studies out of 7 publications are included in this review. None of the studies were based in the UK and therefore none were investigating a healthcare system directly comparable to that of the NHS.

Two studies primarily focused on direct patient reported outcomes such as quality of life or symptom burden (Brinkman-Stoppelenburg et al. 2020b, Rocque et al. 2015). Four studies focused mainly on economic outcomes such as length of stay, readmission rates, cost and subsequent treatments (Adelson 2017, Brinkman-Stoppelenburg et al. 2020a, May et al. 2015, Riedel et al. 2017).

There is some evidence that palliative care consultation reduced readmission rates, increased hospice use and reduced chemotherapy post discharge. Adelson et al. (2017) demonstrated that palliative care consultation significantly reduced readmission rates at 30 days post discharge from 35% to 18% ($p=0.04$). Riedel et al. (2017) demonstrated a significant reduction (OR of 0.76) for 7-day readmission (95% CI, 0.58 to 1.00; $p=0.048$) but this was not statistically significant at 30 days. Hospice inpatient unit referrals increased from 14% to 26% with automatic referral to palliative care review for patients with advanced cancer ($p=0.03$) and receipt of chemotherapy post discharge was reduced from 44% to 18% ($p=0.03$) (Adelson et al. 2017).

There was no significant evidence that palliative care intervention impacted on length of stay in this cohort, with one study demonstrating slight decrease (Riedel et al. 2017) and two studies demonstrating a slight increase in length of stay (Brinkman-Stoppelenburg et al. 2020a, May et al. 2015). May et al. (2015) suggested that overall, palliative care patients had slightly longer and therefore more expensive stays in hospital on average. However, early palliative care review showed a significant cost saving effect. Review within 2 days of admission reduced total costs by 24% and review within 6 days reduced by 14%. Brinkman-Stoppelenburg et al. (2020a) found that although palliative care consultation reduced the average daily hospital costs from €757 to €607 further analysis showed this was not statistically significant. There was no statistically significant impact on ICU admissions although two US studies demonstrated an association with decreased ICU transfers (Adelson et al. 2017, Riedel et al. 2017).

There were mixed results for the impact on patients' quality of life (QoL) or symptoms. Palliative care team consultation decreased patients' symptom burden and tended to have a positive effect on QoL of hospitalized patients with advanced cancer. After adjusting for baseline differences at day 14, patients who had a SPCT consultation had significantly better scores for pain, appetite loss and emotional functioning, physical functioning and global health status on the EORTC QLQ C15 PAL questionnaire (Brinkman-Stoppelenburg et al. 2020b). However, Rocque et al. (2015) demonstrated that palliative care review improved patient understanding regarding the incurable nature of cancer but showed no statistically significant change in quality of life, symptom burden or patient satisfaction. However, study limitations such as poor survey response rates and difficulty with implementing automatic palliative care consultation need to be noted.

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A. Reliability of evidence

All studies included were quasi-experimental in design, the majority being prospective cohort studies and none being randomised control trials, with associated inherent bias. Participant selection was also biased in most studies as non-English speakers were excluded, along with those with cognitive impairment. Rocque et al. (2015) did include non-English speakers and those with cognitive impairment but did not give them surveys to complete. Rocque found participants were mostly married Caucasians who had medical insurance, not likely to be representative at population level. Brinkman's study findings were difficult to interpret due to the fact multiple papers were drawn from the COMPASS study Brinkman-Stoppelenburg et al. (2015). For paper 'a' they did not identify a sample size which makes the results difficult to generalise. In paper 'b' they also identified significant loss to follow up which meant they could not assess involvement of SPCT beyond 14 days. Rocque et al. (2015), May et al. (2015) and Brinkman-Stoppelenburg et al. (2020) all identified either small sample sizes, low rates of survey return throughout or significant participant attrition throughout. Riedel et al. (2017) did not provide information on non-responders, allowing for the potential of non-response bias.

B. Consistency of evidence

It is difficult to compare the studies included in terms of consistency, considering they have varying study designs, outcome measures, and interventions including timing and content and are set in different healthcare structures. Consistency within our examined outcomes is described above in detail where possible.

C. Relevance of evidence

We sought evidence for early palliative care integrated with acute oncology services, looking at patient reported outcomes, quality of life and cost effectiveness. None of the studies were based in the UK. This makes assessing the relevance of cost effectiveness difficult given the different structures of global healthcare systems, although all studies were taken from countries with healthcare economies similar to ours. It is difficult to assess whether costs of care in the USA for example is similar to unbilled costs in the NHS. None of the models exactly mirrored the acute oncology services used in Wales, or specifically described the structure of the palliative care teams used as intervention. Overall, there is no universally agreed structure for either an oncology service or a palliative care service and therefore interpretation of the interventions made must be done with caution. Brinkman-Stoppelenburg did not use specialists in palliative medicine at all, but rather other physicians (neurologists, medical oncologists, and anaesthesiologists) using a holistic assessment method.

Brinkman-Stoppelenburg et al. (2020) and May et al. (2016) felt that their data was generalizable to a specific group of patients that is patients with advanced cancer late into their diagnosis, which although we did not specify, is likely to be the cohort of patients encountered by AOS/SPCT services in the UK in hospitals.

Staffing was identified as an issue in Rocque et al. (2015) and Riedel et al. (2017), where the interventions placed a strain on the SPCT due to the large increase in number of consultations. Again, this would be relevant to UK liaison teams, which are often small and specialist.

Glossary:

ACP - Advanced Care Planning
AOS - Acute Oncology Services
CNS - Central Nervous System
EuroQoL-5D - European Quality of Life Scale-5 Dimensions
EORTC-QLQ-C15-PAL - European Organisation for Research and Treatment of Cancer-Quality of Life Questionnaire-Core 15-for Palliative Care
ICU - Intensive Care Unit
IP - Inpatient
LOS - Length of Stay
MDT - Multidisciplinary Team
OECD - Organisation for Economic Co-operation and Development
ONC - Oncology
PM - Palliative Medicine
SPCT - Specialist Palliative Care Team

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Evidence Implications:

Clinical:

- The limited evidence that is available suggests there is some evidence that early SPCT involvement with AOS can result in better symptom control and had a positive impact following discharge with reduced readmission rates, increased hospice referral and reduced chemotherapy post discharge. There is no robust evidence for a reduction in length of stay or overall admission cost.
- There is some suggestion that average daily costs for palliative care patients were reduced and this highlights the need for further research to investigate this.
- The involvement of SPCT with AOS patients may significantly increase the number of consultations and may impact the staffing levels for a small SPCT.
- Future research should focus on UK based studies with more robust methodology, focusing on patient experience and cost effectiveness of combined AOS and SPCT intervention in acute oncology inpatients.

Policy:

Since none of the studies were UK based with variable health structures and quality of SPCT, the findings are not directly transferrable to an NHS system.

Flow Diagram:

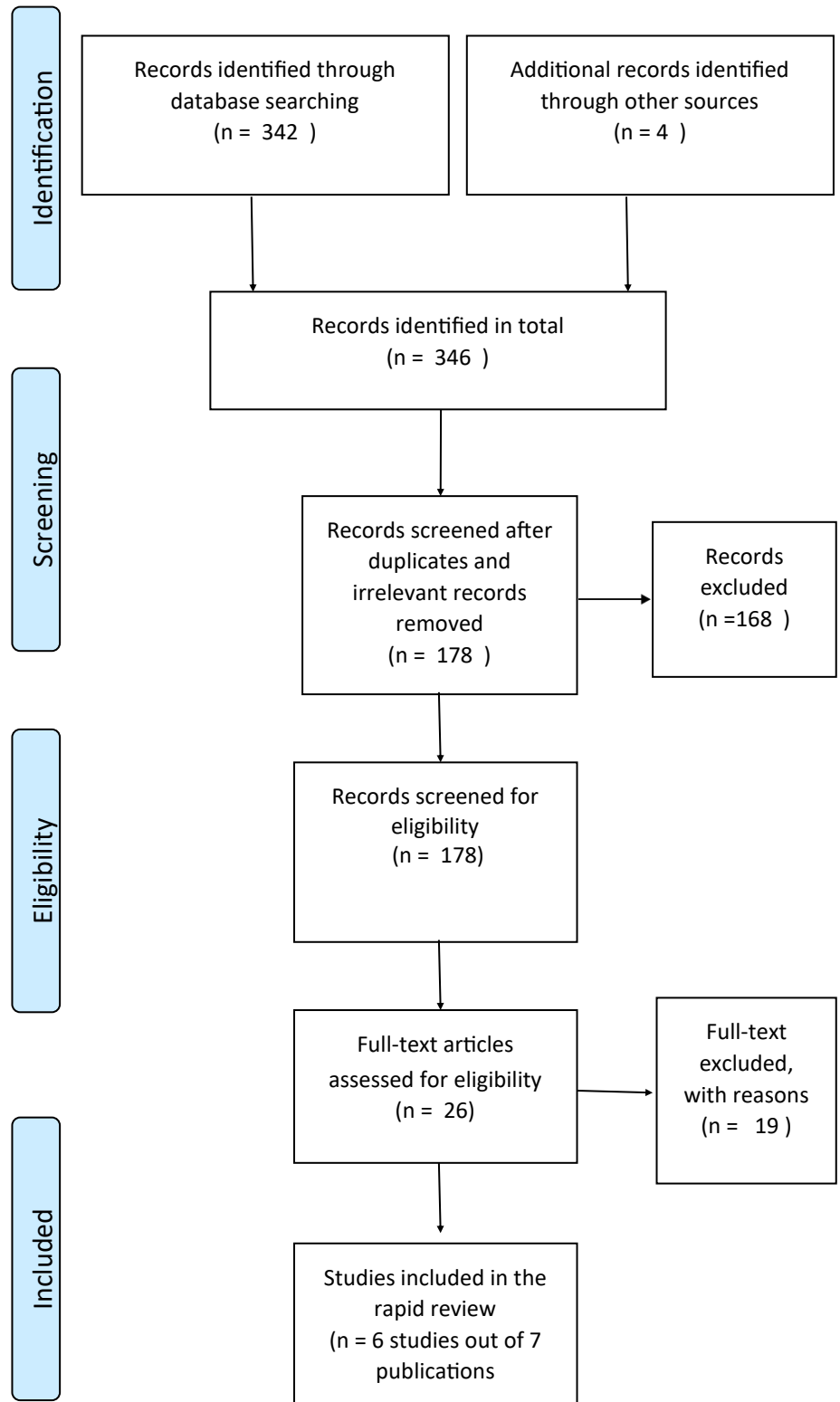


Table 1: Characteristics of Included Studies

Adelson et al. 2017	Study Setting & Design – Oncology inpatient service in a single urban academic medical centre in New York City, New York, USA. Prospective Cohort Study
Study Objective	To evaluate the outcomes of an automatic palliative consultation for patients with solid tumors admitted to the inpatient oncology service.
Participants	Hospital inpatients with solid tumours and at least one of the following criteria: advanced cancer (stage IV solid tumor or stage III lung or pancreatic cancer) (87%); prior hospitalization within 30 days (11%); hospitalization >7 days (7%); and any active symptoms including pain, nausea and/or vomiting, dyspnea, delirium, and psychological distress (28%).
Interventions/Comparators/Methods	Automatic palliative care consultation for patients with solid tumors admitted to the inpatient oncology service. For control group, palliative care consultations were not mandated but could be obtained if requested by the primary team.
Proposed Outcomes	<ul style="list-style-type: none"> Length of stay (LOS) Referral rates to hospice Hospital readmission rates Use of the ICU Discharge location and services Receipt of chemotherapy after discharge
Summary of Results	Study demonstrates that using triggers for referral to PC improved multiple health care utilization and quality measures including: <ul style="list-style-type: none"> 30-day readmission rates, decreased from 35% to 18% (P = .04) hospice referrals increased from 7 of 48 (14%) to 17 of 65 (26%), p = .03; receipt of chemotherapy following discharge decreased from 21 of 48 (44%) to 12 of 65 (18%), p = .03. No significant change in LOS or ICU use. Expansion of this model to other hospitals and health systems could improve the value of cancer care.
Appraisal Summary	This study may not be generalizable due to several limitations. It was a single centre study, excluding non-English speakers and not all of the patients who were identified as eligible for a consultation received it.
Brinkman-Stoppelenburg et al. 2020a	Study Setting & Design – Inpatient wards of 12 hospitals, including general, teaching and university hospitals in Rotterdam, The Netherlands. Prospective Cohort Study.
Study Objective	To investigate the association between specialist palliative care team (SPCT) consultation and the content and costs of hospital care in patients with advanced cancer.
Participants	Patients with advanced cancer and estimated life expectancy less than 1 year who were admitted to an acute setting and expected to stay in hospital for at least 3 days.
Interventions/Comparators/Methods	Interest: SPCT involvement and impact on hospital care content and cost. The SPCTs included at least two medical specialist and a nurse who met weekly. It was expected that SPCT members should also have access to consult with other disciplines including oncologists, neurologists, and anaesthesiologists. Comparison: Hospital patients with advanced cancer with <1 life expectancy who did not have PC team involvement.
Proposed Outcomes	<ul style="list-style-type: none"> Hospital length of stay Use of diagnostic procedures Use of medications and therapeutic interventions
Summary of Results	Study found: Patients with SPCT consultation had a median length of stay in the hospital of 11 days (Interquartile range (IQR) 8–18), compared to 9 days (IQR 5–17) for patients without SPCT consultation Diagnostic procedures included blood tests (used in 94% of patients in both groups), X-rays (used in 52% of patients with and 50% of patients without SPCT consultation), CT-scans (used in 54% and 39%, respectively) and urine tests (used in 42% and 28% respectively) Invasive therapeutic procedures were used in 14% and 19%, respectively, and chemotherapy in 4% and 20% respectively. Total mean costs of hospital care during 3 months of follow-up: <ul style="list-style-type: none"> €8,393 for patients with SPCT consultation €8,631 for patients without SPCT consultation
Appraisal Summary	This is part of a larger study. There are several limitations including : <ul style="list-style-type: none"> no sample size calculated as this was a secondary analysis of data which may have affected the significance of results. propensity scores were used to control for confounding as an imbalance of prognostic factors was pre-empted and may introduce bias.

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Characteristics of Included Studies

Brinkman-Stoppelenburg et al. 2020b	Study Setting & Design – Medical Oncology Wards across 9 participating hospitals, Rotterdam, The Netherlands. Prospective Cohort Study.
Study Objective	To investigate the effect of SPCT consultation on QoL and symptom burden of hospitalized patients with advanced cancer in daily practice.
Participants	Patients with advanced cancer aged 18 years or older admitted to acute setting AND the attending physician answered “no” to the surprise question: “Would you be surprised if this patient would die in the next year?” AND who were expected to stay in the hospital for at least 3 days.
Interventions/ Comparators/ Methods	Interest: Inpatient palliative care team consultation. No actual intervention just observed differences. Comparison: Eligible patients who completed questionnaire but did not have PC consultation.
Proposed Outcomes	Quality of Life using 3 questionnaires: <ul style="list-style-type: none"> Palliative Outcome Scale (POS) (patient-reported scores on physical symptoms, QoL, emotional, social, psychological, and spiritual aspects) EuroQoL-5D (assesses mobility, self-care, usual activities, pain/discomfort, anxiety/depression) EORTC QLQ-C15-PAL (14 questions on symptoms and functioning and 1 question on global QoL).
Summary of Results	EORTC QLQ C15 PAL: After adjusting for baseline differences at day 14, patients with SPCT consultation had <ul style="list-style-type: none"> significantly better scores for pain appetite loss and emotional functioning, physical functioning and global health status EQ-5D: <ul style="list-style-type: none"> No association between PC involvement and POS No association between PC involvement and QoL
Appraisal Summary	Small sample size and the loss to follow-up was significant. They were not able to assess the effect of SPCT involvement beyond 14 days of follow-up. This is part of a larger study which makes data collection and analysis challenging. Despite mentioned limitations this information is still reliable and useful.

May et al. 2015	Study Setting & Design – Five hospitals across the USA. A multisite prospective observational cohort study
Study Objective	To examine whether timing of palliative care has an impact on its effect on cost following admission of patients with advanced cancer to an acute setting.
Participants	Patients admitted to hospital, >18 years, metastatic solid tumour, CNS, locally advanced head and neck or pancreatic tumour, metastatic melanoma or transplant ineligible myeloma or lymphoma.
Interventions/ Comparators/ Methods	A palliative care consultation with a specialist inter-disciplinary team- standardised consultation model which was monitored. Aim for this to be within 48 hours. Compared with usual care- each individual hospital/service’s approach to routine assessment.
Proposed Outcomes	<ul style="list-style-type: none"> Total direct cost of hospital care (excluded indirect costs such as cost of running a hospital (maintenance etc)) Patient and family outcomes (symptom control, satisfaction with care), processes of care (prescribing, transition management, advance planning), and utilization (hospital costs, length of stay [LOS])
Summary of Results	<ul style="list-style-type: none"> Palliative care patients had slightly elevated costs and LOS on average. Earlier treatment is associated with a larger cost saving effect - care within 2-7 days reduces costs by 24%, within 6-7 days by 14% likely due to reduced LOS and treatment intensity.
Appraisal Summary	Even though measures were taken to minimize observed confounding there is likely unobserved heterogeneity between treated and comparison patients. Generalisability is limited especially as the data were collected from hospitals with well-established palliative care programmes.

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Characteristics of Included Studies

Riedel et al. 2017 Ray et al 2019	Study Setting & Design - Duke University Hospital, USA. Retrospective Cohort Study.
Study Objective	To assess the effect of a novel, fully integrated inpatient medical oncology and palliative care partnership on a solid tumour inpatient service at a tertiary medical centre during its first year of implementation.
Participants	Patients admitted to the solid tumor inpatient service. Discharged to hospice care between September 1, 2009, and June 30, 2010 ("pre-PC integration" cohort), and September 1, 2011, and June 30, 2012 ("post-PC integration" cohort)
Interventions/ Comparators/ Methods	Introduction of a PC specialist as the 'attending physician' serving one third to one half of the of the IP service based on a joint decision by oncologist and PC after a presentation of each patient's case. Pre and post intervention groups analysed. Of the second group- some patients did not have the PC intervention but were included in analysis.
Proposed Outcomes	<ul style="list-style-type: none"> length of stay Intensive care unit (ICU) transfer rate, discharge disposition, time to emergency department return, time to readmission, 7- and 30-day emergency department return and readmission rates, and pre- and post-model implementation
Summary of Results	The concurrent PC provided by specialist PC clinicians was associated with statistically and clinically significant lower odds in 7-day readmission rates (P = .0482). Patients in the postintervention group had a decrease in mean length of stay (20.30 days; 95% CI, 20.62 to 0.02); P = .0651). The study observed a trend for: <ul style="list-style-type: none"> increasing hospice referrals (P = .0837) 15% decrease in intensive care unit transfers (p = .61).
Appraisal Summary	<p>Limitations of this study include:</p> <ul style="list-style-type: none"> retrospective nature of the analyses, which limits interpretation to association study took place at a tertiary care facility <p>However, the model shown can serve as a framework and implemented for a successful partnership between ONC and PC.</p>

Rocque et al. 2015	Study Setting & Design – Academic Medical Centre, University of Wisconsin Hospital, USA. Prospective, Pre-post sequential Cohort Study.
Study Objective	To identify the impact of implementing triggered palliative care consultation (TPCC) as part of standard care for patients admitted to the solid-tumor oncology service with advanced cancer.
Participants	Patients with advanced cancer, defined as having incurable disease or distant organ-based metastases and an unplanned cancer-related hospital admission.
Interventions/ Comparators/ Methods	<p>Cohort 1- Normal practice, PC consultations were triggered by ONC team as per normal practice i.e., complex symptoms.</p> <p>Cohort 2- patients receive 'triggered palliative care consult' if identified as having advanced cancer and an unplanned admission, regardless of performance status. This is focused on illness understanding, prognostic awareness, physical symptoms, and goals for care.</p> <p>Cohort 3- process modified to avoid identified barriers to consults- PC staff member attended MDTs to identify eligible patients and to enhance communication between ONC/PM. Content of consult was modified to focus on disease understanding and goals of care plus gave handout about PC and ACP.</p>
Proposed Outcomes	Baseline survey on health-related quality of life, symptom burden, satisfaction and illness understanding.
Summary of Results	Disease understanding improved during initial admission in cohort 2 and 3 with 94% patients identifying their cancer was incurable (vs 65% in cohort 1) – not statistically significant. No change in: <ul style="list-style-type: none"> health related QOL, symptom burden satisfaction. No difference in ACP or hospice use including no difference in enrolment in hospice for >3 weeks (primary outcome). No significant difference in survival.
Appraisal Summary	Difficulties with implementation due to short stays, high acuity symptoms, and individual provider resistance. Meaningful outcomes have been captured despite limitations related to poor survey response rates. Generalisability maybe limited but possible.

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References to studies included in this review:

- Adelson, K. et al. 2017. Standardized Criteria for Palliative Care Consultation on a Solid Tumor Oncology Service Reduces Downstream Health Care Use. *Journal of Oncology Practice/American Society of Clinical Oncology* 13(5), pp. e431-e440. doi: 10.1200/JOP.2016.016808.
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- May, P. et al. 2016. Palliative Care Teams' Cost-Saving Effect Is Larger For Cancer Patients With Higher Numbers Of Comorbidities. *Health Affairs* 35(1), pp. 44-53. doi: 10.1377/hlthaff.2015.0752.
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- Rocque, G. B. et al. 2015. A Quantitative Study of Triggered Palliative Care Consultation for Hospitalized Patients with Advanced Cancer. *Journal of Pain and Symptom Management* 50(4), pp. 462-469. <https://doi.org/10.1016/j.jpainsymman.2015.04.022>.

Additional references:

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- Temel, J. S. et al. 2010. Early Palliative Care for Patients with Metastatic Non-Small-Cell Lung Cancer. *New England Journal of Medicine* 363(8), pp. 733-742. doi: 10.1056/NEJMoa100067
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- Zimmermann, C. et al. 2014. Early palliative care for patients with advanced cancer: a cluster-randomised controlled trial. *Lancet*. 2014 May 17;383(9930):1721-30. doi: 10.1016/S0140-6736(13)62416-2.

Excluded Studies:

A number of studies have been excluded due to various reasons including the following:

- Wrong population: generally, outpatients.
- Wrong study designs, where studies were designed to test the specific intervention rather than general palliative care input.
- Studies not designed to evaluate impact of early palliative care intervention. Studies based in oncology clinics and not acute hospitals.

Additional materials available upon request:

- Critical appraisal / data extraction forms
- Search strategies
- List of excluded studies

This report should be cited as follows:

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