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Prospective cohort study of an Australian cancer care services-led model of emergent care

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Abstract.

Objective. Many cancer care services (CCS) provide pragmatic models of emergent care for their patients as part of 'business as usual' without understanding the scope of this work. We aimed to describe an Australian CCS-led model of emergent care and quantify and profile emergent care provided over a 6-month period to understand scope and demand.

Methods. This prospective cohort study was performed at a large tertiary hospital on the eastern coast of Australia in 2016. The study explored emergent care provided during business hour and after-hours, including telephone advice, unplanned care and unplanned admissions. Data were collected via electronic hospital records and clinical nurses regarding who accessed care, why care was accessed, what care was provided and how the episode of care ended.

Results. Between March and September 2016, 1412 episodes of unplanned care were provided in the CCS-led model of care, including 307 episodes of telephone advice (237 patients; min max 1–4 episodes per patient; 825 episodes of unplanned care (484 patients; min max 1–9 episodes per patient) and 280 unplanned admissions (233 patients; min max 1–6 episodes per patient). During the same time, an additional 459 unplanned admissions (361 patients) occurred via the emergency department (ED), of which 125 (27.2%) occurred during business hours which could have been managed by the CCS. Most people who received care experienced issues associated with disease or treatment and had received systemic anticancer therapy in the past 30 days.

Conclusions. The data demonstrate that a significant volume of emergent care was provided within the CCS over the study period, in addition to planned cancer treatment. Due to the ever-increasing demands on EDs and the significant need for emergent care for people with cancer, there is need for CCS-led models of care to provide specialist emergent care specifically for people who are receiving systemic anticancer therapy. Such models must be adequately resourced to meet the needs of patients, carers and healthcare professionals.

What is known about the topic? There is increasing focus on innovative models of emergent care for people with cancer in the out-patient setting to relieve pressure on EDs and improve patient experiences. Limited literature has focused on such models in the Australian context.
What does this paper add? This paper describes, quantifies and profiles care provided in a pragmatic CCS-led model of emergent care in a large tertiary hospital in Australia over 6 months. The data demonstrate significant demand for emergent care within business hours, as well as out of hours, predominantly for people undergoing systemic anticancer therapy.
What are the implications for practitioners? The findings of this study highlight the need for CCS to develop pragmatic models of emergent care. Appropriate resources, infrastructure, policies and procedures are required to adequate meet the needs of patients and carers.

Keywords: avoidable, cancer care, cohort study, department of emergency, emergent care, model of care.

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Introduction

People with cancer frequently experience acute complications related to their underlying disease or treatment of the disease that often require emergent care and hospitalisation.[1] In Australia, people with cancer access emergency departments (EDs) almost twice as often as those without a cancer diagnosis,[2] leading to significant clinical and economic burden.[3] The need for emergent care is expected to intensify due to cancer therapies increasingly being delivered in out-patient areas,[4] rising demand for cancer treatment, increasing complexity of cancer and treatments, increasing range of novel treatments, and an aging population with multiple comorbidities.[5,6]

The management of acutely unwell people with cancer is often complex and requires interactions between several professionals and specialty.[1] This complexity can lead to difficulties in decision making and coordination of care, patient safety concerns and poor patient experiences and outcomes.[7] Australian data demonstrate that people with cancer who attend EDs have higher acuity, management times, mortality and length of stay in the ED compared with the general population.[3,8] A substantial proportion of people with cancer presenting to EDs are experiencing disease- or treatment-related symptoms that may be more appropriately managed via their specialist cancer team or via alternative pathways of care provided in cancer care services (CCS).[9,10]

Internationally and in Australia, there is increasing focus on innovative models of emergent care for people with cancer in the out-patient setting to relieve pressure on EDs and improve patient experiences and outcomes.[4,7] To the best of our knowledge, five published studies have described and/or evaluated Australian CCS-led models of emergent care: a rapid assessment clinic staffed by cancer nurses and oncologists,[11] nurse practitioner-led urgent assessment clinic and consultation services,[12,13] nurse-led symptom and urgent review clinics[4] and a nurse practitioner providing emergent care within a chemotherapy unit.[14] None of these studies described or evaluated long-standing models that organically developed within CCS in response to local need without dedicated funding.

Various CCS-led models or pathways of emergent care that aim to reduce avoidable ED presentations and hospitalisation have been reported or evaluated in the literature, in particular telephone advice services and unplanned care and assessment units (for further details, see Table 1).[7] Many of these models or pathways emerged organically and pragmatically, building on and integrating with existing services to address local needs (e.g. telephone advice services), whereas other models are standalone healthcare services that required the investment of significant resources (e.g. oncology medical centres).[7] Variations in locations, settings, funding schemes and healthcare systems, as well as methodological limitations in study designs, limited the translation of this knowledge without an understanding of local need.[7] In addition, few of these studies explored the role of the patient and carer as valuable and active partners in accessing emergent care.[7]

Anecdotally, it has been observed that most Australian out-patient CCS provide varying levels and forms of emergent care for their patients as 'business as usual', outside of formal models of care. In many cases, emergent care is absorbed into planned care in busy out-patient departments. Although this approach is pragmatic, it may not be sustainable long term as the demand for emergent care continues to increase in the out-patient setting in line with growing pressure on EDs.[4] Models of care are often developed to bridge service gaps rather than as a planned strategic response to an identified local need.[15] It is vital that CCSs understand local need and consumer experiences and consider current literature when planning, developing, implementing and assessing models of care for their patients.

The aims of this study were to describe a long-standing, pragmatic, CCS-led model of emergent care in a large tertiary hospital in Australia and to quantify and profile emergent care

Table 1. Overview of CCS-led models of emergent care reported in literature review[7]
NP, nurse practitioner

Models of care	Country
Telephone advice services	UK, Canada
Provided by oncology nurses	
Operational 24 h a day, 7 days a week or during business hours only	
Unplanned care and assessment units	USA
Staffed with oncology nurses and specialists	
Assess, treat and monitor symptoms and complications in the out-patient setting (aim to discharge home with 24 h)	
Operational 24 h a day, 7 days a week	
Acute oncology services	UK
Nurse consultant provided acute oncology services in oncology out-patient department or ED	
Operational 24 h a day, 7 days a week or during business hours only	
Medical oncologist embedded in the ED	USA
Medical oncologist reviewed oncology patients within the ED	
Operational on the late shift, 6 nights per week (not overnight)	
Proactive case management by clinical nurse specialists	UK
Specialist oncology nurses provided proactive case management to a particular population of out-patient oncology patients (e.g. lung cancer)	
Nurse-led assessment clinics	USA, Australia
NP-led symptom management and supportive care services for people who received anticancer therapy	
Supportive care services for out-patients	Italy
Multidisciplinary supportive care services for oncology out-patients	
Oncology specialists, nurses, psychologist and spiritual assistant	
Operational during business hours only	
Mixed models of care	UK, Spain, USA, Australia
Any combination of any of the above	

provided over a 6-month period. The overarching aim of the study was to understand the scope of, and demand for the service.

In this study, emergent care was defined as care provided in response to an emergent health care issue, such as a change in condition (physical, emotional or psychosocial) that required input from a healthcare professional. This included infections, temperatures, treatment, or cancer-related symptoms (i.e. pain, nausea), falls and distress.

Methods

Model of care description

The aim of the CCS-led model of emergent care was to manage, treat and/or admit patients, avoiding ED presentations whenever feasible through pragmatic pathways of care, including: (1) telephone advice provided in out- and in-patient departments; (2) unplanned care provided in out-patient departments; and (3) facilitation of unplanned admissions via out-patient departments. Fig. 1 shows the pathways of care in the model of care during business hours and after-hours.

All patients who are to receive treatment within the CCS are provided education and an information pack containing contact telephone numbers during business hours and after-hours. In addition, cancer care coordinators provide patients with their contact details if they have questions or concerns. After-hours (weekdays 1630–0800 hours, weekends and public holidays), patients known to CCS (and their carers) are encouraged to contact nursing staff in the in-patient wards for telephone advice. Patients with urgent issues after-hours are advised to present to the ED (Royal Brisbane and Women's Hospital (RBWH) or elsewhere) and the cancer nurse will liaise with the ED via telephone and fax and hand over any relevant information.

During business hours (Monday to Friday, 0800–1630 hours), patients known to CCS (and their carers) are encouraged to contact a CCS nurse via telephone for advice. If they require review, the nursing and medical team will identify whether there is capacity to safely see a patient in the CCS out-patient department. If not, they will be directed to the ED. Patient calls are taken by a shift coordinator or clinic nurse in the out-patient areas. After-hours, the ward shift coordinator in the in-patient areas (or another senior nurse if appropriate) takes the telephone call. Only experienced oncology nurses are responsible for managing patient calls, with the use of a Clinical Telephone Advice Form that prompts data to be collected on the clinical situation, advice provided and subsequent actions taken. This form is not a triage tool. Advice is provided based on clinical experience. Medical advice is often sought on the appropriate course of action.

During business hours, patients can present to the CCS out-patient department (with or without a planned appointment) for additional unplanned care, where they are assessed, treated and discharged, or admitted to in-patient wards. Alternatively, patients who present to the ED can be transferred to a CCS out-patient department for management, pending capacity in the CCS. Patients who present for unplanned care are seen within general areas of the out-patient department during business hours. They are allocated space, resources and medical review within the general areas of the out-patient department on a case-by-case basis as per clinical need. Medical review of patients

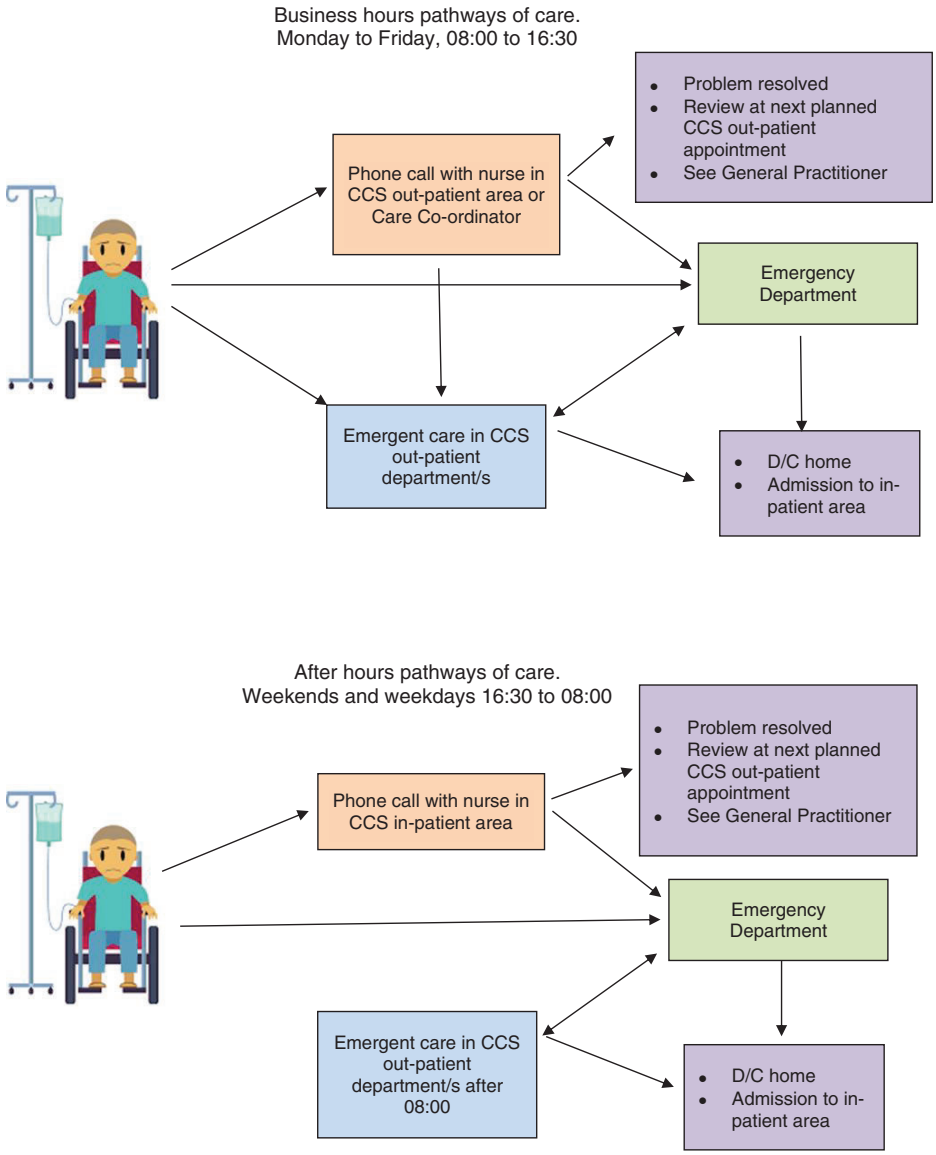


Fig. 1. Pathways of care in the CCS-led model of care during business hours and after-hours.

requiring unplanned care is largely provided by medical teams, in addition to covering planned care. A haematology resident is rostered in the out-patient department specifically to support the provision of emergent care between 1000 and 1830 hours (but also supports planned care).

Nursing care is provided by nurses in addition to planned patient care. At the time of data collection, no nurse practitioners were available to support emergent care provision. A range of procedures can be provided in the out-patient areas, including medication administration, intravenous fluids, antibiotics, blood products, dressings, central line management, ascitic drainage and investigations (e.g. coordination of imaging, blood collection, septic screens, electrocardiograms). Reviews are also facilitated in the out-patient space with consultative services (e.g. specialist palliative care services) and the multidisciplinary team (e.g. social work, psychology). There, reviews are initiated by medical and nursing teams based on clinical need.

Study design

We conducted an observational study to quantify and profile episodes of emergent care within the model of care over a 6-month period (March–September 2016) to determine who accessed care, why care was accessed, what care was provided and how the episode of care ended.

Setting

This study was conducted in the RBWH, a large tertiary referral teaching hospital located on the east coast of Australia.[16] The CCS cares for people with all types of cancers and has three out-patient units and two in-patient wards.

Sample

Data were collected on all patients with 'emergent care' needs who: (1) accessed telephone advice; (2) accessed unplanned care within the out-patient departments ('unplanned care'); and/or (3) experienced an unplanned admission via the out-patient department. Data were also collected on unplanned admissions into the CCS via the ED to contextualise findings and identify areas of need or potential expansion of the CCS-led model of care. Prospective data were not available on unplanned care provided in the ED for people with cancer unless they received an admission under a CCS physician. Interhospital transfers were excluded. Study size was determined by convenience sampling in the present descriptive exploratory study.

Data collection

Data were collected prospectively by clinical staff and a project nurse. For unplanned care, data collected included the date and time of the episode of emergent care, the reason for the episode of emergent care, the emergent care provided and the outcome of the emergent care. Individual patient information was collected regarding cancer treatment, recent discharge, the presence of severe neutropenia (absolute neutrophil count $<0.5 \times 10^9$ L^{-1}) and whether the patient was known to the RBWH Specialist Palliative Care Service at the time of the episode of care. Data were not collected on emergent care provided at other healthcare facilities because we were interested in profiling our model of care to inform and improve future service provision.

Admission details (including the reason for admission) were recorded by the CCS bed manager (a senior nurse who manages all admissions). For unplanned care and telephone advice, data were collected on the reason for the episode of care, the care provided and the outcome of care by the nurse responsible for that episode of care. Due to the high number of calls received daily in the oncology clinics of the out-patient department, nurses working in this area only collected overall numbers of telephone advice for 1 week. All nurses and care coordinators in the in- and out-patient areas were asked to collate records of the telephone advice they provided.

Categories for the reason for the episode of emergent care were based on the relevant literature[7] and clinical assessment by relevant clinical teams. Nursing staff involved in the project were educated regarding data collection, and descriptions were provided for each variable collected. Mortality outcomes were collected until 6 months after the initial episode of emergent care. Data were cross-referenced against hospital records by the project nurse for accuracy (e.g. date of birth, disease, reason for admission, recent treatment received).

Data analysis

Data were analysed in IBM SPSS version 26. Descriptive statistics were computed to describe all variables in this descriptive exploratory study.

Ethical considerations

An exemption of ethics approval was granted by the RBWH Human Research Ethics Committee because this project was deemed to be a service evaluation activity (Review no. HREC/15/QRBW/526). The principles outlined in the National Health and Medical Research Council document Ethical Considerations on Quality Assurance and Evaluation Activities were followed.[17]

Results

Between March and September 2016, 1412 episodes of emergent care were provided within the CCS, including 307 episodes of telephone advice (237 patients; median 1 episode of telephone advice per patient, min-max 1–5), 825 episodes of unplanned care (484 patients; median 1 episode per patient, min-max 1–9) and 280 unplanned admissions (233 patients; median 1 admission per patient, min-max 1–6). Over the same time frame, 459 unplanned admissions occurred in 361 patients (median 1 admission per patient, range 1–6) via the ED. A flowchart of episodes of care in the CCS is shown in Fig. 2. Patient and disease characteristics for all episodes of care are provided in Table 2. The reasons for accessing emergent care are provided in Table 3.

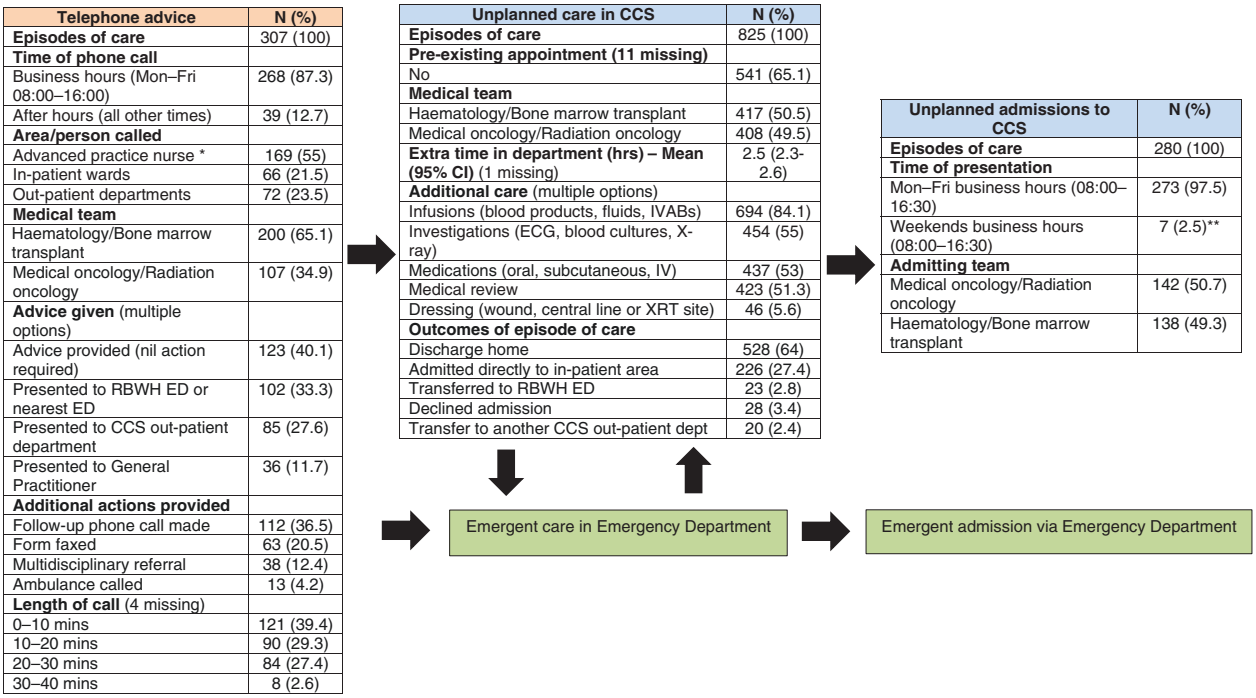
Telephone advice

Overall, the most common reasons for calling were systemic anticancer therapy, advice regarding procedure or vascular access device/systemic anticancer therapy delivery ($n = 93$; 30.3%) or infections ($n = 46$ (15%); see Table 3). Most telephone calls did not necessitate a presentation to an ED. The three most common outcomes for telephone advice were: (1) advice provided and nil action required ($n = 123$; 40.1%); (2) present to RBWH ED or nearest ED ($n = 102$; 33.3%); and (3) present to CCS out-patient department ($n = 85$; 27.6%). Patients were advised to follow-up with their general practitioner (GP) for 11.7% of calls ($n = 36$). Most calls were made during business hours ($n = 268$; 87.3%) and lasted between 0 and 10 min ($n = 121$; 39.4%), with a combined time of 83 h over the study period. In all, 113 (36.8%) and 45 (14.7%) patients calling for telephone advice had received radiotherapy or systemic anticancer therapy respectively within the previous 30 days.

Of note, telephone advice was under-reported in the study due to clinical demands. In many cases, collection of telephone calls was overly burdensome on busy clinicians. In addition to telephone advice forms collected in the study, nurses working in oncology clinics recorded 15 calls in a standard 1-week period specifically for emergent care because their acuity precluded them from collecting data for the 6-month study period. This demonstrates an additional 390 in calls in a 6-month period (15 calls × 26 weeks). With this number included, the estimated overall number of telephone advice calls was at least 687 (with many still under-reported in other areas).

Unplanned care

Overall, 66% ($n = 541$) of episodes of unplanned care were for patients presenting without a planned appointment. The average additional time (additional to planned or booked appointments) spent in the department was 2.5 h (95% confidence interval (CI) 2.3–2.6) per episode of care, with a total of 2027 h over the 6-month period. Most patients presenting for unplanned care had received systemic anticancer therapy ($n = 54$; 66.2%) within the



*Nurse Practitioner/Clinical Nurse Consultant/Care Co-ordinator
**The 7 patients admitted during business hours over the weekend were outliers as the model of care does not routinely operate over the weekend

Fig. 2. Flowchart of episodes of care in pathways of emergent care in the CCS.

Table 2. Patient and disease characteristics for all episodes of emergent care in the CCS
Unless indicated otherwise, data are presented as *n* (%)

	Telephone advice	Unplanned care	Unplanned admissions
Total no. presentations	307 (100)	825 (100)	280 (100)
Mean (range) age (years)	49.7 (18–84)	58.5 (16–91)	59.0 (17–89)
Male sex	181 (59)	427 (51.8)	162 (57.9)
Cancer diagnosis			
Solid tumour	107 (35)	404 (49)	144 (51.4)
Haematological malignancy/disorder	77 (25)	405 (49)	136 (48.6)
Haemophilia	123 (40)	16 (2)	–
Systemic anticancer therapy in past 30 days	45 (14.7)	546 (66.2)	176 (62.9)
Radiation therapy in past 30 days	113 (36.8)	202 (24.5)	61 (21.8)
Bone marrow transplant in past 100 days			
Allogeneic	14 (4.6)	59 (7.2)	14 (5.0)
Autologous	4 (1.3)	6 (0.7)	0 (0)
Neutropenic[A] ($<0.5 \times 10^9$ L^{-1})	–	147 (17.8)	42 (15)
Discharge in last 7 days	36 (11.7)	109 (13.2)	35 (12.5)
Known to RBWH Specialist Palliative Care Service	15 (4.9)	72 (8.7)	29 (10.4)
Deceased within 1 month	14 (4.6)	40 (4.9)[B]	21 (7.5)
Deceased within 3 months	20 (6.5)	108 (13.2)[B]	51 (18.2)
Deceased within 6 months	38 (12.4)	188 (22.9)[B]	79 (28.2)
Mean (95% CI) time to death (days)	147.7 (119.5–176)	150 (137.8–162.2)[B]	116.1 (97.6–134.7)

[A]Neutropenic data not collected for telephone advice.
[B]Four cases of missing data on mortality for unplanned care.

previous 30 days. The most common reasons for unplanned care were management of reduced blood cell counts or deranged electrolytes and fevers or infections (Table 3); 18% of patients were severely neutropenic. Although 188 patients (23%) died within 6 months of the episode of care, only 72 (9%) were linked to the RBWH Specialist Palliative Care Service.

Table 3. Reasons for episodes of emergent care in the CCS

Telephone advice	*n* (%)	Unplanned care in CCS	*n* (%)	Unplanned admissions	*n* (%)
Total no. calls	307 (100)	Total no. unplanned care	825 (100)	Total no. unplanned admissions	280 (100)
Reason for call		Reason for unplanned care		Reason for unplanned admission	
Systemic anticancer therapy, procedure or device	93 (30.3)	Reduced blood cell counts or deranged electrolytes	316 (38.3)	Infections	60 (21.4)
Infections	46 (15)	Infections	94 (11.4)	Disease (new, relapsed or progressive)	26 (9.3)
Other[A]	32 (10.4)	Renal dysfunction	65 (7.9)	Nausea and vomiting	20 (7.1)
Uncontrolled pain	29 (9.4)	Nausea and vomiting	48 (5.8)	Uncontrolled pain	23 (8.2)
Nausea and vomiting	27 (8.8)	Mucositis, dysphagia, reduced oral intake	47 (5.7)	Mucositis, dysphagia, reduced oral intake	14 (5.0)
Reduced blood cell counts or deranged electrolytes	24 (7.8)	Cardiac	45 (5.5)	Functional decline	13 (4.6)
Diarrhoea	11 (3.6)	Systemic anticancer therapy, procedure or device	36 (4.4)	Other[A]	17 (6.1)
Functional decline	10 (3.3)	Other[A]	36 (4.4)	Reduced blood cell counts or deranged electrolytes	15 (5.4)
Mucositis, dysphagia, reduced oral intake	9 (2.9)	Uncontrolled pain	29 (3.5)	Cardiac	13 (4.6)
Constipation	8 (2.6)	Disease (new, relapsed or progressive)	26 (3.2)	Respiratory	10 (3.6)
Neurological		Respiratory	16 (1.9)	Renal	14 (5.0)
Respiratory	6 (2.0)	Functional decline	14 (1.7)	Syncope or altered level of consciousness	6 (2.1)
Gastrointestinal, hepatobiliary	4 (1.3)	Graft versus host disease	14 (1.7)	Neurological	8 (2.9)
Cardiac	4 (1.3)	Syncope or altered level of consciousness	12 (1.5)	Seizure	6 (2.1)
Psychiatric (suicide, anxiety, depression)	2 (0.7)	Diarrhoea	9 (1.0)	Systemic anticancer therapy, procedure or device	16 (5.7)
	2 (0.7)	Neurological	8 (1.0)	Gastrointestinal, hepatobiliary	4 (1.4)
		Gastrointestinal, hepatobiliary	7 (0.8)	Graft versus host disease	9 (3.2)
		Seizure	1 (0.1)	Diarrhoea	4 (1.4)
		Constipation	1 (0.1)	Constipation	4 (1.7)
		Delirium	1 (0.1)	Delirium	2 (0.7)

[A]'Other' included skin eruption, wound, lesion, rash (not including graft versus host disease), bleeding (not including intracranial, gastrointestinal or per rectal) and other not specified.

Unplanned admissions

The most common reasons for unplanned admissions were fevers or infections ($n = 60$; 21.4%), disease (investigations of new, relapsed or progressive disease; $n = 26$; 9.3%), uncontrolled pain ($n = 23$; 8.2%) and nausea and vomiting ($n = 20$; 7.1%). Most unplanned admissions were for people who had received systemic anticancer therapy in the past 30 days ($n = 176$; 62.9%). In almost one-third of unplanned admissions, patients died within 6 months ($n = 233$, 31.5%), with the mean time to death being 103 days from the admission (95% CI 92.5–114.1 days).

During the study period there were an additional 125 unplanned admissions via the ED during business hours (Monday–Friday 0800–1630 hours) for cancer-related issues, including infections ($n = 166$; 36.6%), new, relapsed or progressive disease ($n = 46$; 10%), nausea and vomiting ($n = 36$; 7.8%) and uncontrolled pain ($n = 29$; 6.3%). In this population, 56.4% ($n = 259$) had received systemic anticancer therapy within the past 30 days and 98 patients (21.4%) were severely neutropenic ($<0.5 \times 10^9$ L^{-1}).

Discussion

This study quantified and profiled emergent care provided in a pragmatic Australian CCS-led model of emergent care in a large tertiary hospital over a 6-month period. The data demonstrate that a substantial volume of emergent care was provided within the CCS-led model of care, in addition to planned cancer treatment, over the study period: 2027 h of unplanned care and 83 h of telephone advice (which was potentially underreported). This highlights the significant role CCSs play in providing emergent care as part of 'business as usual'.

The results of this study highlight that patients who had recently received or were currently receiving acute cancer treatment and experiencing associated side effects had the greatest need for emergent care (Tables 2, 3). Similar findings have been described in other studies reporting CCS-led models of care.[7,12] Most care provided in the model was for people experiencing cancer disease- or treatment-related issues, such as infections, nausea and vomiting, uncontrolled pain, equipment or medication advice or systemic anticancer therapy-related issues (Table 3). In addition, a significant number of patients

were neutropenic when they were provided emergent care (17.8% of those accessing unplanned care, 15% of those with unplanned admissions). These findings indicate that CCS-led models of emergent care may be best placed to focus on people receiving anticancer therapies, as has been reported in other studies evaluating CCS-led models of emergent care.[4,7] The high incidence of cancer-related issues and specialised cancer care provided for this population also demonstrate a need for models of care led by cancer specialists and oncology nurses.

Our data indicated that although a significant amount of emergent care was provided during business hours, there is a potential need for more resources and longer operational hours to manage a greater number of episodes of emergent care for people with cancer. An additional 125 unplanned admissions occurred during business hours (0800–1630 hours) via the ED that could have been managed in the CCS. We were unable to capture emergent care provided in the ED that did not lead to an admission. Therefore, it was unclear how many episodes of this type of care may also be provided within the CCS out-patient departments rather than in the ED.

At the time of the study, all emergent care provided in the CCS was in addition to planned care booked into scheduling systems in out-patient departments or standard patient care in the in-patient wards (telephone advice only). No dedicated space, staff or other resources were provided towards the model, although the model was a long-standing practice. Data exploring the impact of the unplanned care on medical or nursing workloads or patient care, outcomes and experience in CCS were not collected. Anecdotally, it was noted that there could be long wait times for planned appointments when other patients required emergent care. Medical and nursing staff reported difficult shifts due to clinical acuity during busy times. Nursing and medical staff in the out-patient department had the option to advise patients to present to the ED if it was too busy to safely provide care for them in addition to planned care. However, patients often stated a preference to be cared for within the CCS.

Since this project was completed, the CCS has appointed a part-time nurse practitioner to support the provision of emergent care during business hours. The CCS is also seeking dedicated funding and designated clinical areas to expand the pragmatic CCS-led models of care. Appropriate policies and procedures are also required to safely deliver care.[7] An economic evaluation is needed to justify dedicated resources being directed to the CCS to provide emergent care. An Australian economic evaluation of a nurse-led model of emergent care compared with ED care for people receiving system anticancer therapy demonstrated a return on investment of AUS$1.73 for every AUS$1 spent on establishing the new service.[4] An effectiveness and cost-effectiveness study is currently underway within the CCS (led by the authors of this paper) to justify additional resources to expand the model of care. The data in the present study were collected in 2016; hospital records reveal an 8.5% increase in unplanned admissions during the same time period in the subsequent year (September 2017–18). This increase demonstrates local need for a CCS-led model of emergent care at tertiary hospitals similar to the RBWH.

Although the data demonstrate that our model of care provides a significant amount of emergent care for our patients, they also highlighted potential areas for improvement. Practices that have been shown to be effective in the literature include pathways or algorithms for managing patients with emergent care needs, dedicated space for 'rapid assessment clinics', the collection of patient-reported outcomes with alerts to clinicians and roles for nurse practitioners who provide emergent care to people with cancer.[4,7,12] Due to clinical acuity, our cancer nurses reported that they were unable to record all telephone advice provided; therefore, this service was under-reported and not accurately represented in this study. These challenges demonstrate there is a need for refinement of the telephone advice service so there is a single point of call (during business hours and after-hours) and standardised education and advice for patients and carers when accessing this service, as has been demonstrated to be successful in other CCSs in the literature.[7,12] Two Australian studies of emergency models of care[12,13] report on the use of a telephone triage toolkit that is available in eviQ (UKONS Toolkit[18]). This toolkit supports healthcare professionals to provide standardised triaged telephone advice 24 h a day for people receiving or who have received cancer treatment.[18] A Rapid Assessment and Access Toolkit (Australia), Triage Tool and Telephone Advice Triage Log sheet are available on the eviQ website (https://www.eviq.org.au/clinical-resources/telephone-triage-toolkit/3637-triage-tool).

Many people with cancer who were provided emergent care were close to the end of life and potentially had palliative care needs at the time emergent care was provided; 31.5% of episodes of unplanned admissions were for people in their final 6 months of life. The literature reflects high ED use by people with cancer who are near the end of life.[19,20] Our data indicate a need for greater integration of specialist palliative care services for people undergoing acute cancer treatment in the out-patient space. It is recommended that Australian CCS-led models of emergent care have systems in place to identify people who are at high risk of dying and to conduct palliative needs assessments, anticipatory palliative care planning and needs-based referrals to specialist palliative care services in order to holistically care for their patients, as is recommended in national clinical standards and best practice guidelines.[21,22]

The results of this study also suggest a potential disconnect between acute cancer care and primary care, with very few patients advised to follow-up with their GP when they telephoned for advice. GPs are integral to integrated and comprehensive cancer care and should be included throughout the optimal cancer care pathway.[23] Community models of care can provide business hours and after-hours care for people undergoing acute cancer care to support acute care facilities. eviQ provides health professional fact sheets for GPs on cancer side effects, supporting patients receiving anticancer therapy and managing common adverse effects of anticancer medicines (https://www.eviq.org.au/clinical-resources/health-professional-fact-sheets). It is recommended that CCS-led models of care use and assist in the development of resources that support greater integration between hospitals and primary care. Since this study, the RBWH CCS has strengthened links with primary care via the establishment of a GP daily help line, a shared-care project in haematology, the appointment of a GP liaison officer and (soon to commence) employment of a GP with special interest in oncology. There is great opportunity for primary care involvement in expanding the model of emergent care.

Conclusion

The provision of emergent care for people with cancer will become increasingly important in the years to come, in line with rising demand, increasingly complex patients and a greater number of cancer therapies provided in out-patient areas. Australian CCSs are tasked with the challenge of developing or expanding innovative, effective and cost-effective models of care to provide high-quality patient-centred care. Our data demonstrate that a pragmatic Australian CCS-led model provided a significant amount of emergent care for people largely receiving anticancer treatment and experiencing cancer-related side effects or complications. With appropriate resources, infrastructure, policies and procedures, similar models of care can meet the needs of patients and carers, and plan for a future with continually increasing demand on out-patient services and EDs under pressure. The challenge to leaders of CCSs is to develop customised models of care in partnership with consumers, in response to local needs, and to engage in ongoing evaluation of patient experience, service demands and the quality, safety and efficacy of the care provided over time.

Competing interests

The authors declare no competing interests.

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References

1 RCP. Cancer patients in crisis: Responding to urgent needs. London; 2012.
2 Bureau of Health Information. The Insights Series: Emergency department utilisation by people with cancer. Sydney, NSW; 2014.
3 Livingston PM, Craike M, Slavin M. Clinical and economic burden of emergency department presentations for neutropenia following outpatient chemotherapy for cancer in Victoria, Australia. *Oncologist* 2012; 17: 998–1004. doi:10.1634/theoncologist.2011-0456
4 Shih STF, Mellerick A, Akers G, Whitfield K, Moodie M. Economic assessment of a new model fo care to support patients with cancer experiencing cancer- and treatment-related toxicities. *J Oncol Pract* 2020; . doi:10.1200/JOP.19.00702
5 Insitute of Medicine. Delivering high-quality cancer care: Charting a new course for a system in Crisis. Washington, DC; 2013.
6 Bray F, Ren JS, Masuyer E, Ferlay J. Global estimates of cancer prevalence for 27 sites in the adult population in 2008. *Int J Cancer* 2013; 132: 1133–45. doi:10.1002/ijc.27711
7 Northfield S, Button E, Wyld D, Gavin NC, Nasato G, Yates P. Taking care of our own: A narrative review of cancer care services-led models of care providing emergent care to patients with cancer. *Eur J Oncol Nurs* 2019; 40: 85–97. doi:10.1016/j.ejon.2019.02.005
8 van der Meer DM, Weiland TJ, Philip J, Jelinek GA, Boughey M, Knott J, *et al*. Presentation patterns and outcomes of patients with cancer accessing care in emergency departments in Victoria, Australia. *Support Care Cancer* 2016; 24: 1251–60. doi:10.1007/s00520-015-2921-4
9 Díaz-Couselo FA, O'Connor JM, Nervo A, Tossen G, Guercovich A, Puparelli C, *et al*. Nonscheduled consultation in oncologic patients. How many of them are true emergencies? An observational prospective study. *Support Care Cancer* 2004; 12: 274–7. doi:10.1007/s00520-003-0584-z
10 White K, Roydhouse J, O'Riordan L, Wand T. Interventions for reducing the use of adult Emergency Department services by cancer patients: an Evidence Check rapid review brokered by the Sax Institute (http://www.saxinstitute.org.au) for the Cancer Institute NSW, 2013.
11 Kuo JC, De Silva M, Diwakarla C, Yip D. A Rapid Access Clinic to improve delivery of ambulatory care to cancer patients. *Asia Pac J Clin Oncol* 2017; 13: 179–84. doi:10.1111/ajco.12641
12 Oatley M, Fry M. A nurse practitioner–led model of care improves access, early assessment and integration of oncology services: An evaluation study. *Support Care Cancer* 2020; 28: 5023–9. doi:10.1007/s00520-019-05292-0
13 McCavery A. A Nurse Practitioner-Led Model to Implement and Deliver Unscheduled Emergency Cancer Care. *J Nurse Pract* 2020; 16: 271–5. doi:10.1016/j.nurpra.2019.12.020
14 Cox K, Karikios D, Roydhouse JK, White K. Nurse-led supportive care management: a 6-month review of the role of a nurse practitioner in a chemotherapy unit. *Aust Health Rev* 2013; 37: 632–5. doi:10.1071/AH13069
15 Davidson P, Halcomb E, Hickman L, Phillips J, Graham B. Beyond the rhetoric: What do we mean by a 'model of care'? Faculty of Science, Medicine and Health - Papers: part A. 2006.
16 Australian Government. My Hospitals: Australian Government; 2019. Available from: https://www.myhospitals.gov.au/hospital/royal-brisbane-and-womens-hospital/emergency-department.
17 National Health and Medical Research Council. Ethical Considerations in Quality Assurance and Evaluation Activities. 2014. Available from: https://www.nhmrc.gov.au/sites/default/files/documents/attachments/ethical-considerations-in-quality-assurance-and-evaluation-activites.pdf.
18 eviQ. Telephone Triage Toolkit Australia: eviQ; 2019. Available at: https://www.eviq.org.au/clinical-resources/telephone-triage-toolkit/3637-triage-tool [verified 21 June 2021].
19 Rosenwax LK, McNamara BA, Murray K, McCabe RJ, Aoun SM, Currow DC. Hospital and emergency department use in the last year of life: a baseline for future modifications to end-of-life care. *Med J Aust* 2011; 194: 570–3. doi:10.5694/j.1326-5377.2011.tb03106.x
20 Goldsbury DE, O'Connell DL, Girgis A, Wilkinson A, Phillips JL, Davidson PM, *et al*. Acute hospital-based services used by adults during the last year of life in New South Wales, Australia: a population-based retrospective cohort study. *BMC Health Serv Res* 2015; 15: 537. doi:10.1186/s12913-015-1202-8
21 ACSQHC. National Consensus Statement: Essential elements for safe and high-quality end-of-life care. Sydney; 2015.
22 ACSQHC. National Safety and Quality Health Service Standards (second edition). Sydney; 2017.
23 Cancer Australia. General Practitioners and Cancer Care Australia: Cancer Australia; 2021. Available from: https://www.canceraustralia.gov.au/clinical-best-practice/cancer-learning/general-practice-and-cancer-care.