

# Chemotherapy outpatients' unplanned presentations to hospital: a retrospective study

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## Abstract

**Goal of work** This descriptive, retrospective study sought to identify the nature and magnitude of chemotherapy outpatients' unplanned presentations and admissions to the emergency department and/or cancer centre at a large metropolitan tertiary hospital, and to explore the antecedents to those presentations.

**Patients and methods** Retrospective data were collected for outpatients who made an unplanned presentation to a large metropolitan hospital in Sydney, Australia between October 1, 2006 and September 30, 2007. Detailed information was collected for those who had received cytotoxic chemotherapy at the hospital's cancer centre within the 6 months prior to the unplanned presentation to hospital. Demographic and explanatory variables were identified, including: reasons for presentation, cancer diagnosis, chemotherapy regimens, and position in the chemotherapy trajectory.

**Main results** The Cancer Institute NSW [27] figures indicate that each year approximately 518 outpatients are treated with chemotherapy at the participating cancer centre. During the study period, 316 cancer outpatients made 469 unplanned presentations to either the Cancer Centre or the hospital emergency department. Of those outpatients presented, 233 (73.7%) had received chemotherapy in the previous 6 months and made a total of 363 presentations. Of these 363 presentations, 253 (69.7%) occurred within 4 weeks of receiving chemotherapy. The majority of presentations by those who had received chemotherapy in the previous 6 months resulted in hospital

admission (87.6%) for a median length of stay of 5 days. The most frequent presentation symptoms were nausea and/or vomiting (45.2%), pain (27%), fever and/or febrile neutropenia (23.4%), shortness of breath (19.3%), dehydration (12.1%), anaemia (8.8%), fatigue (8.8%), diarrhoea (8.8%), and anxiety and/or depression (5.5%).

**Conclusions** Chemotherapy outpatients have significant unmet needs following treatment, indicating an urgent need for improved continuity of care and better integration of primary and tertiary health care services.

**Keywords** Cancer · Chemotherapy · Outpatients · Unplanned presentations · Community care

## Introduction

This paper reports on a retrospective study designed to determine the magnitude and nature of chemotherapy outpatients' unplanned presentations to hospital. Significant patient suffering is associated with side effects of chemotherapy [1, 2]. In 2006, there were 106,000 new cancer cases diagnosed in Australia and it is currently estimated that the number of cancer patients treated with chemotherapy is increasing by 6.8% per year [3, 4]. It is estimated that 50% of cancer patients receive chemotherapy at some stage in their cancer illness [5]. Alongside the rising numbers of cancer cases, there is an increasing trend towards outpatient chemotherapy treatment [6, 7]. Recent research in the US indicates that side effects of chemotherapy may be more common than previously reported and clearly associated with significant patient suffering and health care expenditures [1]. Hasset and colleagues [1] suggest that incremental expenditure in the US for hospitalisations or emergency room visits by women receiving chemotherapy for breast

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cancer could reach \$45 million per year. To date, however, little research has focused on the management of community-based care of chemotherapy outpatients, and, in particular, on reducing their need for unplanned presentations and admissions to hospital. This is a significant issue, given that the chemotherapy patient trajectory is increasingly embedded in community settings.

It is well documented that the side effects of chemotherapy regimens can be distressing and debilitating [1, 8]. Chemotherapy outpatients and their carers are frequently managing the physical and psychological effects of chemotherapy at home whilst simultaneously ‘coming to terms’ with a cancer diagnosis [7, 9]. Although effective management of chemotherapy side effects is linked to improved patient outcomes [10], research suggests that patients who are managing symptoms at home are at risk of being undertreated as they tend to be invisible to healthcare services [11, 12].

Chemotherapy-induced nausea and vomiting can be significant problems, despite major improvements in their treatment [10, 11]. Research suggests that delayed chemotherapy induced nausea and vomiting, which affect 50–74% of chemotherapy patients, continue to be significant problems that are underestimated and undertreated [9, 11–13]. This is of particular concern for outpatients, since these problems usually occur following discharge from the clinic or hospital and patients and carers are therefore managing at home at a distance from their treating cancer centre [11]. Uncontrolled nausea and vomiting not only affect physical and emotional well-being, but are also linked to poor treatment outcomes due to delay, reduction or refusal of chemotherapy [14, 15] and may lead to an unplanned visit to hospital [1].

Chemotherapy related fatigue is also a significant problem, with an estimated 76% of chemotherapy patients continuing to experience debilitating symptoms of fatigue [16]. Outpatients are particularly vulnerable to being undertreated, especially since chemotherapy patients tend to assume that little can be done and do not seek assistance [16]. They are therefore more likely to suffer severe fatigue [16, 17], which is, in turn, associated with reduced adherence to treatment programmes and has negative implications for cancer survival [18].

Recent research indicates that 43% of cancer patients do not receive adequate pain relief [19]. Outpatients are considered particularly disadvantaged due to difficulties in obtaining accurate information and advice on tailoring pain relief to individual needs and the additional burden of dealing with the side effects of pain medications [20]. Untreated pain impacts on the capacity of cancer patients to engage in work and social activities [21]. Untreated pain is also associated with unplanned admissions to hospital [21].

Febrile neutropenia is a potentially life-threatening side effect of chemotherapy and a common cause of hospitalisation of outpatients [1, 22]. It is increasingly the focus of

attention because of associated healthcare costs and the elevated risk of nosocomial infections [1, 22–24]. While outpatient management of febrile neutropenia for low-risk groups is becoming more feasible, safe, and efficacious [22, 24, 25], early identification and treatment are extremely important.

A recent qualitative study in the UK indicates that outpatients dealing with chemotherapy side effects suffer significant disruption to family, social, and work relationships [9]. Other studies identify psychological issues as the most pressing, and frequently unmet, care needs of cancer patients [17]. These unmet needs can be cumulative and cause significant emotional distress for outpatients and carers [9].

Early identification and collaborative management of chemotherapy side effects within the community has the potential to improve outpatient confidence in managing adverse events at home [7]. Few studies have investigated the relationship between unmet needs of chemotherapy outpatients and unplanned visits to emergency departments and cancer centres. Hassett et al. [1] US study of unscheduled visits to emergency departments by breast cancer outpatients found that those who had received chemotherapy were more likely to make unplanned visits to hospital than those who had not (61% compared to 42%), and that chemotherapy side effects accounted for 22% of all hospitalisations in this patient group.

The retrospective study reported on here identified and analysed the number and nature of chemotherapy outpatients’ unplanned presentations to the emergency department (ED) and/or cancer centre (CC) at a large metropolitan tertiary referral hospital in Sydney, Australia over a 12-month period. The project was a response to anecdotal evidence from clinicians suggesting that many cancer patients were returning to hospital for acute care following outpatient administration of chemotherapy. Little was known about the magnitude of this problem or about the events that led to patients taking this course of action.

Research questions:

1. How many cancer outpatients who made unplanned presentations to the ED and/or the CC between 1 October 2006 and 30 September 2007 had received chemotherapy at the CC in the previous 6 months?
2. What were the general characteristics of those outpatients who had received chemotherapy in the previous 6 months and who made unplanned presentations to hospital?
3. How many of these unplanned presentations resulted in a hospital admission?
4. At which point in their chemotherapy treatment trajectory did chemotherapy outpatients make an unplanned presentation to hospital?
5. What was the reason for the unplanned presentation to ED and/or CC?

## Materials and methods

### Patients and procedures

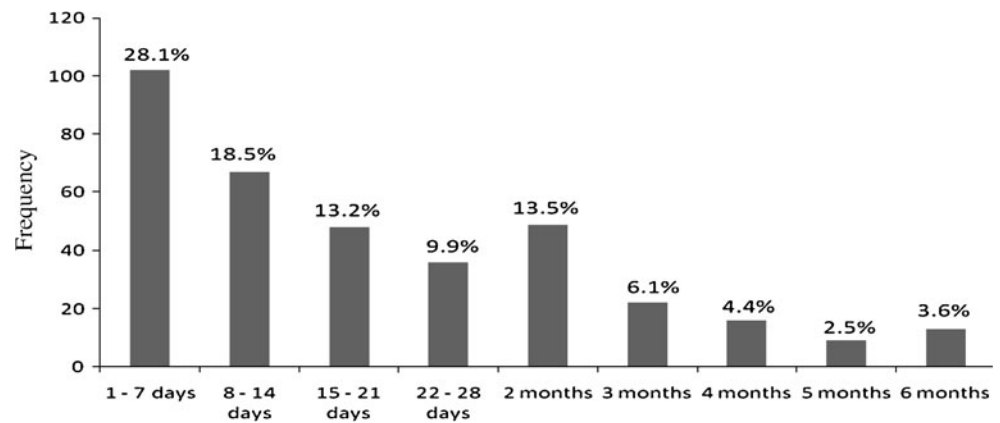
This retrospective study focused on chemotherapy outpatients who made unplanned presentations to a large metropolitan hospital ED and/or CC within 6 months of receiving chemotherapy at the hospital's CC. The participating CC has 27 chemotherapy outpatient chairs and treats approximately 518 chemotherapy patients per year in total. Researchers had access to the CC and ED databases, CC outpatient files and patient medical records for the period October 1, 2006 to September 30, 2007. The study had approval from the relevant hospital and university human research ethics committees.

Data collection took place between July and October 2008. All cancer patients who had been treated at the CC and made unplanned presentations to the hospital during that period were identified. Haematology outpatients and patients under 18 years of age were excluded from the study. CC and ED presentation and admission data were cross-referenced against the CC patient treatment book to identify those people who had received chemotherapy within 6 months of their unplanned presentation to hospital. Explanatory variables were also identified for each person, including: reason(s) for presentation, cancer diagnosis, chemotherapy regimens, position in chemotherapy trajectory, action(s) taken and outcome of the visit, and demographic variables of age, gender, postcode, marital status, and country

**Table 1** Demographic and clinical characteristics of 233 outpatients presenting between October 1, 2006 and September 30, 2007 who had received chemotherapy in the previous 6 months

Characteristics	Number	%
Gender		
Male	120	51.5
Female	113	48.5
Age		
Mean and standard deviation	58.86 years SD 13.56	
Range	18-89 years	
Marital status		
Married/defacto	138	59.2
Not married	81	34.8
Unknown	14	6
Country of birth		
Australia	108	46.4
New Zealand	9	3.9
Europe	41	17.6
Asia	15	6.4
Other/unknown	60	25.7
Principle diagnosis		
Breast cancer	49	21
Lung cancer	46	19.7
Colorectal cancer	30	12.9
Head and neck cancer	17	7.3
Pancreatic	13	5.6
Sarcoma	11	4.7
Ovarian cancer	8	3.4
Other	59	25.3
Treatment intent		
Curative	71	30.5
Palliative	135	57.9
Unknown	27	11.6
Number of presentations		
One	157	67.4
Two	48	20.6
Three	18	7.7
Four or more	10	4.3

**Fig. 1** Elapsed time since last chemotherapy and unplanned presentation



of origin. All data were de-identified at the point of collection. Interviews with a sub-sample of patients were also undertaken and the results are reported separately.

#### Data analysis

Quantitative data were entered into and analysed using SPSS V16. Descriptive statistics only have been calculated. Tally data related to hospital presentations are presented as counts and percentages; continuous data are presented as means (standard deviation) or median (interquartile range) depending on normality.

#### Results

During the retrospective study period, there were records for 469 unplanned presentations to hospital from 316 cancer patients. Of the 316 cancer outpatients, making unplanned presentations during the study period, 233 (73.7%) presented within 6 months of receiving chemotherapy and made a total of 363 presentations (77.4% of all presentations). The remaining 83 outpatients (26.3%), who had not received chemotherapy within the preceding 6 months, made 106 presentations (22.6% of all presentations). However, as the focus here is on chemotherapy outpatients, results for this latter group are not discussed in this paper.

The general characteristics of the 233 outpatients are presented in Table 1. The mean age was 58.9 years (SD 13.56) and 51.5% were male. The majority of outpatients

had a principle diagnosis of breast cancer, lung cancer or colorectal cancer.

Of the 363 unplanned presentations within 6 months of receiving chemotherapy, 253 (69.7%) occurred within 4 weeks of receiving chemotherapy. The majority of these latter presentations occurred within the first 2 weeks of treatment (Fig. 1).

Table 2 shows the frequencies and percentages for number of presentations and number of patients. Of the 363 unplanned presentations, 318 (87.6%) resulted in a hospital admission with a median length of stay of 5 days.

The median length of hospital stay and the associated costs for all presentations within 6 months of receiving chemotherapy are shown in Table 3. Cost estimates are based on estimated bed cost of AU\$1,188/day plus average cost of ED visit at AU\$380 for each visit [3, 26].

The majority of unplanned presentations to hospital made within 6 months of receiving chemotherapy were related to chemotherapy side effects such as nausea and/or vomiting (45.2%), pain (27.0%), and fever and/or febrile neutropenia (23.4%; Table 4). Data obtained from outpatient records indicated that outpatients were frequently suffering these side effects at home for between 2 and 7 days before presenting to hospital.

#### Discussion

This retrospective study demonstrates that cancer outpatients experience high levels of physical and psychological suffering,

**Table 2** Number of unplanned presentations to hospital, number of cancer outpatients presenting, number of chemotherapy outpatients presenting and number of hospital admissions between October 1, 2006 and September 30, 2007

Cancer Centre outpatients making unplanned presentations	Presentations		Patients	
	<i>n</i>	%	<i>n</i>	%
All unplanned presentations to hospital	469	100%	316/518	61.0
Chemotherapy in previous 6 months	363/469	77.4	233/316	73.7
Presentations resulting in hospital admission	318/363	87.6	227/233	97.4

**Table 3** Length of stay and cost of hospitalisation of cancer outpatients who made an unplanned visit within 6 months of receiving chemotherapy

Unplanned presentations	Length of stay in days			Total bed days	Estimated Cost (\$)
	Median	IQR	Range		
Chemotherapy in previous 6 months	5	2-11	1-70	2,622	3,235,776

particularly within the first 4 weeks after receiving chemotherapy, and that this suffering frequently leads to an acute unplanned presentation and admission to hospital. The findings from this study are consistent with those of Hassett et al. [1], who also demonstrated a strong relationship between receiving chemotherapy and making an unplanned visit to hospital. Our study found that chemotherapy outpatients delay seeking help for treatment side effects (2-7 days), particularly if they experience nausea and vomiting. Outpatient records provide some insights into reasons for these delays, for example not wanting to bother busy hospital staff, difficulties associated with travelling to hospital, long waiting times in ED, and hoping that troubling side effects will diminish. By the time they do seek help, their situation is likely to have become more complex and to require hospital admission, for example, to be treated for dehydration and/or constipation. It may also be the case that ED staff will admit to hospital chemotherapy outpatients who present at night or on weekends when the treating CC is closed. It may, therefore, be 2-3 days before patients are seen by their chemotherapy clinicians, who may then order further tests. All of these problems could potentially increase the length of stay in hospital. Clearly there is a need for further research to clarify this situation.

The Cancer Institute NSW [27] indicates that approximately 518 outpatients would be treated with chemotherapy at the participating CC over a 1-year period. Results suggest that just under half of this CC's total chemotherapy population made an unplanned presentation to hospital (45%, 233/518). People who had received chemotherapy in the previous 6 months constituted the major proportion of cancer outpatients presenting (73.7%, 233/316). In fact, as noted above, most of these presentations occurred within the first 4 weeks of receiving chemotherapy.

Hassett et al. [1] suggest that, in their research, the high presentation rate indicates that community-based chemotherapy patients have unmet needs that are serious enough to lead to unplanned presentations to hospital, which cause considerable stress on healthcare resources. Our results indicate that 87.6% (318/363) of presentations within the first 6 months of receiving chemotherapy resulted in an admission to hospital with a median length of stay of 5 days, at an estimated overall annual cost of over AU \$3,000,000 for patients from this CC alone. Results also support previous findings that chemotherapy outpatients managing symptoms at home are at high risk of being under treated [11, 12]. Other research suggests that many of

the problems that outpatients in this study presented with would be conducive to treatment in the community [6, 7, 22]. It is clear that early identification and collaborative management of issues arising for community-based cancer patients is linked to improved patient confidence in managing adverse events at home [7, 28].

We argue here that there is an urgent need for more comprehensive, coordinated and multi-disciplinary approaches to care for chemotherapy outpatients that directly link them with primary care providers as well as cancer centre staff. In Australia, state and national cancer bodies have recognised that coordination of care has become a major issue for cancer patients [29–31]. In addition to the increasing use of multiple treatment modes (surgery, chemotherapy, and radiotherapy), there is concern regarding the loss of continuity of care between acute and primary health care sectors. Central to improving coordination of care and 'care connectedness' is the development of systems that support information sharing [8, 31]. We argue for the need to close the circle of care for chemotherapy outpatients by actively involving community nurses and general practitioners in their community-based care and linking them with specialist staff through improved communication channels and coordinated care.

Little research has focused to date on the role of community nurses in the care of chemotherapy outpatients, although some research does suggest that community nurses can play a pivotal role in supporting cancer patients in the community and in building their confidence to manage adverse events as well as other aspects of their own self-care [32, 33]. The scope of community nursing roles

**Table 4** Reason for unplanned presentations ( $n=363$ ) for patients who had received chemotherapy in the previous 6 months

Reason for presentation	Frequency $n$	%
Nausea and/or vomiting	164	45.2
Pain	98	27.0
Fever and/or febrile neutropenia	85	23.4
Shortness of breath	70	19.3
Dehydration	44	12.1
Anaemia	32	8.8
Fatigue	32	8.8
Diarrhoea	32	8.8
Emotional issues (anxiety/depression)	20	5.5

Percentages add up to more than 100% because categories are not mutually exclusive

has evolved to include many advanced practices, including an already substantial role in caring for cancer patients. In Australia, community nurses are well placed to be coordinators of care for chemotherapy outpatients, particularly as community nursing services exist in all areas, and referral to other professional services is a routine component of their work. This work increasingly involves care of patients with high acuity needs [32, 34, 35] and current continuing education programmes for community nurses reflect these developments [36]. The inclusion of routine chemotherapy updates within these existing programmes is entirely feasible. Community nurses also have expertise in psychosocial care, with the potential to address these identified unmet needs.

## Conclusion

This research has identified significant unmet needs and potentially unnecessary suffering of chemotherapy outpatients during their chemotherapy cycles. These findings have implications for health expenditure, optimal cancer treatment delivery, and overall patient wellbeing, which, arguably, is reflected in the number of unplanned presentations to hospital, many of which result in hospital admissions. Given the increasing number of cancer patients who will receive chemotherapy as outpatients, there is an urgent need for a comprehensive, coordinated and multi-disciplinary approach to providing care for chemotherapy outpatients that directly links them with community nurses, general practitioners, and cancer centre staff. Equally important, this approach needs to be sustainable and feasible within the current healthcare climate.

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